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THE competition for the Boston Public Library building has been decided by the award of the four prizes: the first to Mr. Charles B. Atwood of New York; the second to Messrs. O'Grady and Zerrahn of Boston; the third to Mr. Clarence S. Luce of New York, formerly of Newport, R. I.; and the fourth to Mr. Horace F. Burr of Boston. Nearly all these gentlemen are already distinguished for their ability among the younger architects of the country, and unquestionably well earned the liberal prizes awarded them, and it is not their fault that none of the designs are regarded as suitable for execution. In fact, the competition seems to have been rather hastily arranged, and the competitors were confined by the requirements of a programme which allowed them far too little liberty in arranging their plan. It is as true in architecture as in other things, that nothing but the unexpected is sure to happen; or rather, to adapt the saying to the occasion, the best plan for a building is generally that which no one ever thought of before; and it is almost always a mistake to restrict designers to any model, or preconceived idea of what the arrangement of a given set of rooms should be. One does not always remember, for example, that there are five thousand and forty different ways in which a house of seven rooms can be planned; and he who would build such a house does best to allow himself the privilege of choosing any one of the whole number. With so important a structure as the Boston Library the number of possible arrangements is still greater; and although certain requirements must be fulfilled, they are usually such as would suggest themselves at once to an architect of the most mediocre attainments.

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THE National Capitol at Washington seems to be in a fair way to be converted into a gallery for the exhibition of works by attractive female artists, if we may judge by the action of the Library Committee of the Senate, which reported recently in favor of the purchase of a portrait of the late General Thomas, said to be a colored photograph, by a Miss Ransom, at the remunerative price of ten thousand dollars; together with another picture, representing the Electoral Commission, by Mrs. Fossett, for fifteen thousand dollars. Not having seen the pictures in question, we will not undertake to pass upon their merit, and indeed they could not well be worse than many of those which disgrace the Capitol, and belie the public taste; but we are sure of a more important matter, that the ladies who painted them have no reputation which would justify the payment of such enormous prices out of the public treasury for their works. There are very few painters in the world who could get anything like ten thousand dollars for painting a portrait from a photograph, or who would not think it a piece of very unprofessional impudence to ask such a price; and we are unable to imagine either how those who are intrusted with spending the money raised by taxation from the people of this country can excuse themselves for wasting it in such inordinate compensation for work which would be dear at one-tenth the price, or how artists of honorable feeling can condescend to profit by such maudlin prodigality.

A POINT of extreme importance to architects is discussed in a recent number of *La Semaine des Constructeurs*. It seems that a certain proprietor some years ago had a house built by contractors, under the direction of an architect. The ground on which the house rested was not perfectly firm, and the building settled, causing a few little cracks in the walls. The proprietor took possession, and lived in his house for several years without complaining, or apparently troubling himself about these; but subsequently rented the house to a more particular individual, who demanded that the cracks should be repaired. The proprietor went to the contractor, who suggested that an architect should be called in, to say what ought to be done; but this proposition was refused. The tenant then, without further notice either to the contractor or the architect, called in an expert, who engaged workmen and had such repairs made as he saw fit; and after all was done the bill was presented to the original contractor, who very naturally declined to pay it. The correspondent of *La Semaine*, who tells the story, asks what are the rights of the various parties.

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TO this question the editor replies that although the Code Civil provides that "if a building constructed by contract shall perish wholly or in part, even through defect in the soil, the builder and architect shall be jointly responsible for ten years," it has been decided by the highest court that in order to make the architect responsible it is necessary that the edifice should literally "perish wholly or in part," or, in other words, that "the damage must be serious." It is natural for walls of masonry, and for the ground on which they stand, to settle, and, although architects and builders can, and do, take certain well-known precautions to make the settlement uniform, it is impossible to foresee the direction and amount of all the movements with sufficient precision to avoid all cracking; and so long as the movements do not threaten the stability of the building, or make it unsuitable for habitation, neither the builder nor the architect can justly be held responsible for them. Moreover, even if there had been in the case cited such serious disorders as to endanger the structure, the proprietor and his tenant mistook entirely the method of holding the contractor and architect to the responsibility defined by law. To enforce this responsibility, if the occasion demands it, the architect or the builder, according as the fault is with the design or the execution of the building, must first be notified, and a reference agreed upon, to which he must be a party, and when the extent of his responsibility, if any, is thus legally settled, he can be called upon to perform the duty which the law requires of him. The report of an expert called in by the proprietor or tenant, without the coöperation of the builder, is worthless, and cannot be used against the latter; and an expert examination after the alleged defects have been repaired is likewise useless, since it is then impossible to say positively what the original defects may have been, and the responsibility of a builder or architect cannot be enforced upon anything short of definite and unmistakable evidence.

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A NOVEL, but very commendable feature in school-house architecture has just been introduced in Edinburgh, where the famous High School, one of the most successful adaptations in Great Britain of Greek forms to modern everyday purposes, is to be enlarged by the addition of a gymnasium, and of a swimming-bath, in a separate building; or rather, a new janitor's house is to be built, and the old one altered over into a bath-house. The Scotch, like the Germans, have always been remarkable for their appreciation of systematic education, as distinguished from that picked-up information, mixed with misinformation, which so many persons mistake for knowledge, but the idea of teaching boys the second of the two great classic accomplishments in some reasonably efficient way seems never to have occurred to a School Board before. The apparatus by which the youth of Edinburgh is to be instructed in this manliest of all manly exercises is very simple. The janitor's house is to have the floors removed, and a tank, thirty-two feet long, and fifteen feet wide, formed in the centre, with a platform around it, and dressing-rooms and shower-bath near by. Although of such modest dimensions, the bath is large enough for such a school, and it is safe to say that it will not be long in operation before its advantages will become so

obvious as to lead to the establishment of similar appendages to many other schools.

THE *Builder* calls attention to the tendency of building in England, and points out in a striking way the influence which railway management has upon the movement of population in any country. Almost without exception the great cities of England have gained in population within the last ten years, while the country towns and villages have either remained stationary or have lost; but it is rather surprising to find that among the cities those situated on the coast have gained the most. Apart from the pleasant seaside resorts, like Bournemouth and Hastings, which have recently become very popular as places of permanent residence, the seaports of Grimsby, Hull, Cardiff, Gateshead, Hartlepool, and some others, have gained from thirty to sixty per cent in population within the last decade, while Manchester, the second city in England, has actually declined during that time, and other interior manufacturing towns have either lost, or have gained very little. The fact that manufactures have been transferred to seaport towns from the interior places, which depend on railways for their transportation, is too conspicuous to escape attention, and on examination it is found that the present system of freight charges on the English railways practically prohibits manufacturing in the interior of the country, while it fosters the importation of manufactured products from the Continent in a most effective manner. Thus iron wire, which was once made in great quantities in Birmingham, is now brought by sea from Antwerp to London, and thence carried by rail to Birmingham, at a total expense of four dollars and sixteen cents a ton; while the railway charge for carrying home-made wire of the same kind from Birmingham to London is six dollars and eighty cents. Antwerp is about two hundred miles from London, and Birmingham one hundred, so that, supposing the expense of transportation by sea, and transhipment, to be only half that of transportation by land for the same distance, the Birmingham manufacturer pays eight dollars and eighty-eight cents a ton more than the Antwerp commission merchant for carrying his goods to London. We do not know the price of wire in England, but, supposing it to be forty-four dollars a ton, the discrimination made against the Birmingham manufacturer by the railways amounts to an impost of twenty per cent in his largest market, to which his Continental competitor is admitted free of duty. It is needless to say that no honest business can long sustain such a burden, and the wire manufacture, once one of the principal industries of Birmingham, has been transferred to the new sea-coast manufacturing towns, where it is in a measure independent of the railways. Another town, near Birmingham, is Wolverhampton, where nails are manufactured in great quantities. The port most nearly in the direct route from Wolverhampton to Antwerp, the great distributing centre of the Continent, is Harwich. The present cost of transporting nails from Antwerp to Wolverhampton by way of Harwich, where they are transhipped, is three dollars and ninety-two cents a ton; while the charge for railway transportation alone from Wolverhampton to Harwich, about one-third of the distance to Antwerp, is five dollars and twelve cents a ton. It is evident that the exportation of nails from Wolverhampton to the Continent under such circumstances is out of the question, and the nail manufacturers who wish to supply foreign markets must either remove their works to the coast, where they will no longer depend upon the railways, or give up business.

IN a less degree the same powerful, though unseen influence, is modifying the distribution of population all over the civilized world. It is not an insane desire to live in dirty tenement-houses that draws working people everywhere to the great cities, but the greater certainty that they will find work there, which comes from the concentration of manufactures in them; and the concentration of manufactures in the cities depends upon the fact that the cities are what railway directors call "competing points," and that the same directors, in order to get away each other's business, are generally willing to carry goods between these and other "competing points" for less than cost, making up their loss by exorbitant demands from the manufacturers who have been so ill-advised as to build their works at points which are not "competing," and where they are in consequence at the mercy of the railway companies. In England, where combinations among the railway corporations have taken the place of competition, the number of "competing points" has been reduced so far that all the producers of the country are more or less in their power, and are unmercifully taxed in consequence; while foreign manufacturers, who need not send their goods over English railroads unless they wish, are allured by low rates and special favors to do so. Fortunately for the Englishmen, the sea is near them, and by transferring their business to the coast they can use a highway which is not subject to monopoly, but the process of transfer is costly, and before the interior of the country is quite deserted it may occur to some director that a railway line through an uninhabited country is usually unprofitable, and that a good local business, built up by patient courtesy and fairness, in a spirit of sympathy with the interests and needs of the people who inhabit the territory along the line, is far more remunerative to a railroad than the greedy extortion which treats persons who have the misfortune to need the services of the road as so much prey, to be plundered without mercy whenever they are caught at a disadvantage.

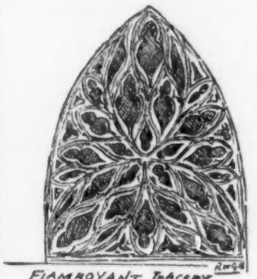
TO find an illustration of the operation of the same law in this country, we have only to open the annual report of a certain Massachusetts railroad company which happens to lie before us. The railroad owned by the company is one hundred and forty-three miles long, but it connects with other roads to form a continuous route both between Boston and the West, and towards the North, and carries a considerable amount of freight between the Mississippi Valley and the seaboard. In its statement of the last year's business of the road, the report says that "The earnings from local freight per ton per mile have been three and forty-four one-hundredths cents," while the earnings per ton per mile, from "freight to and from other roads" have been seventy-eight hundredths of one cent; and the earnings on freight to and from points west of the place where the roads connects with the westward system have been six hundred and nine one-thousandths of one cent per ton per mile. To put it in another way, this railroad has, through the year, charged all the manufacturers living on its line, and dependent upon it for transportation nearly six times as much for carrying their materials and goods as it has their competitors a little west of them, and four-and-a-half times as much as the ones to the north.

A VERY ingenious engineering operation was recently carried out in Philadelphia, for strengthening one of the piers of the Chestnut Street bridge over the Schuylkill River. The bridge, which was built, according to the account in the *Scientific American*, twenty-four years ago, consists of two metal arches over the river, with a pier in the middle, and two stone arches on each side, forming the land spans. The metal arches are each one hundred and eighty-five feet wide, and the stone arches between fifty and sixty feet. On the eastern shore of the river, the foundations of the piers and abutments rested on solid gravel, but at the western end of the bridge the gravel was overlaid with a considerable depth of silt, and, to save the expense of carrying the foundations down through this, piles were driven to the gravel, and the masonry built upon them. The piles were not very long, not more than thirty feet, according to the *Scientific American's* diagram, but the thrust of the metallic arch, which amounts to about two thousand tons horizontal pressure, was sufficient to push them slowly over, through the soft silt, moving the first western pier laterally about eight inches, and deforming the stone land-arches seriously. A temporary expedient was adopted some time ago for checking the movement of the masonry, by placing heavy timber struts across the opening of the land arches, below the level of the roadway, but these, though well placed, were liable to decay, and it was decided to substitute a permanent construction for them. On the suggestion of Messrs. Anderson and Barr, of New York, it was decided to secure the necessary resistance by means of concrete struts, extending from the foundation of the pier next the great arch obliquely through the silt to the rock, some forty-five feet below. A railroad track runs through the arch most affected, and it was important to avoid interfering with the passage of trains, so the necessary excavation was entirely carried on through iron tubes, eight feet in diameter, kept full of compressed air, and extended downward through the silt by the gradual addition of plates, after the method so successfully adopted for building the Hudson River tunnel. Four tubes were constructed, at such an angle with the base of the pier as to contain the line of thrust of the arch, and on reaching the rock were filled with concrete, forming an incompressible and permanent brace.

## A SKETCH OF THE HISTORY OF ARCHITECTURE.[1] — III.

THE invention of stained-glass caused a great change in the form of the windows. Single narrow windows of great height were in use, but the desire for the display of color, and for the attainment of those beautiful effects produced only through stained-glass, led them to widen the windows, until they became overpoweringly large.

But a farther step had to be reached before they could utilize the whole space between the piers for windows. On the introduction of the pointed arch in the groining, the required height in the walls was gained, and it was only necessary to carry the masonry of the vault through the side wall, and rest it upon an arch, springing from the sides of the piers, and then the centre wall below this discharging-arch was free to be done away with, and was in fact a simple screen, filling the space from pier to pier. The pointed arch was then used for the windows and the nave arches, to match with the vaulting. The form of window then in vogue was not altogether pleasing in its effect. The simple lancets set in triplets, and enclosed with a single pointed arch, left vacant spaces of stone in the spandrels, and above the smaller arched windows, and this led the French to abandon the geometrical forms, and to adopt a more flowing tracery. Having found the use of the discharging-arch above, they gave themselves up to the indulgence of all the vagaries of the style peculiar to themselves, and known as "Flamboyant." This was a great contrast to the style in use in England at the same date, called the "Perpendicular," or third pointed style. Every feature underwent changes, and the smallest and most insignificant mouldings were treated, as the styles altered, with care and taste.



FLAMBOYANT TRACERY
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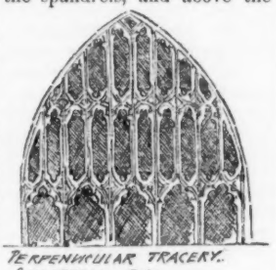
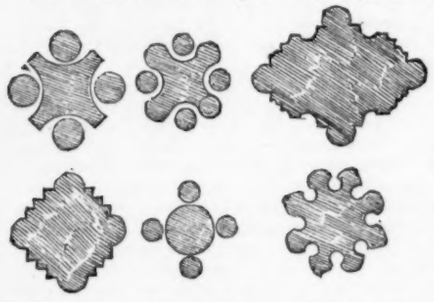
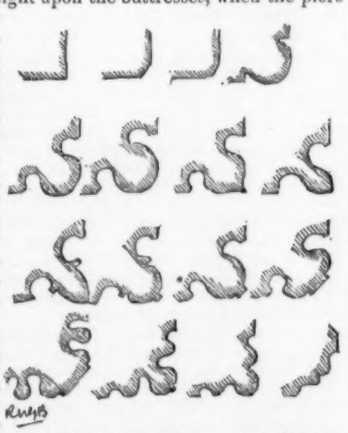


PERPENDICULAR TRACERY.
SWINBROOK. ENG.

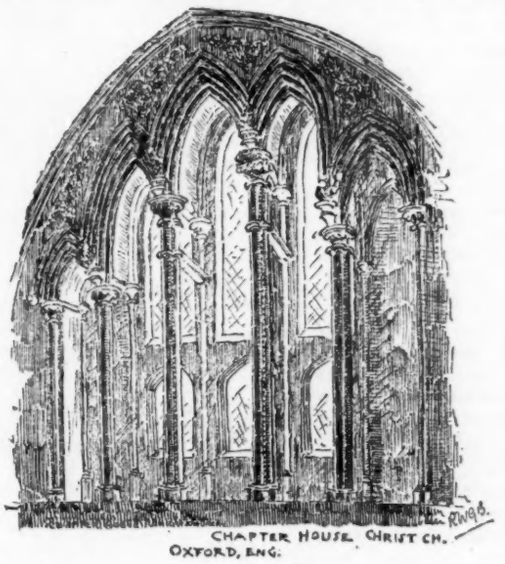
The shafts, columns and piers may be particularly noticed. First, the square pier, with semi-shafts attached, singly or in groups. The hollow spaces were increased in depth, and then such an amount of elaborate small moulding was introduced that the deep hollows could not be obtained, and a waving moulding was the result. Of mouldings, the accompanying diagrams will show the whole history. The extra weight upon the buttresses, when the piers were made to carry the whole weight of the roof, necessitated an increase of weight to assist in the resistance of the roof-thrust upon the buttresses; hence pinnacles were introduced, and these were gradually used as ornamental features, apart from the necessity that gave rise to their invention. In the capitals there may still be traced a reminiscence of the Roman Corinthian order, but under a very different treatment.





We have now rapidly run through the principal changes that took place, and seen the necessity of the hour provided for by the ingenuity of the architects, and most of these apply to the Pointed Gothic in every country, although each nation treated every detail in a manner peculiar to itself, imparting to the stone characteristics of their own, adapting each new idea to suit the requirements of the climate, and then reducing the whole to perfect proportions and harmony, and thereby perfecting an art whose existence began nearly six thousand years ago. Before we leave the subject, it would be greatly to our advantage to look more closely into the treatment by our forefathers of this Pointed Gothic style, for, starting upon the same lines as the French when first the pointed arch was introduced, they perfected for themselves a style which, for simplicity and beauty in the first place, and richness in the second, has not been equalled on any part of the Continent.

It has been usual to date the introduction of the Pointed Gothic into England 1200 A. D., but the vertical principles from which it sprung were not fully developed for nearly thirty years afterwards. Though at first this thirteenth-century or "Early English" style,



CHAPTER HOUSE. CHRIST CH.
OXFORD, ENG.

as it is called, had much of the heaviness of appearance of the former style, yet it soon effaced all semblance of Norman by the development of its own peculiar and beautiful characteristics of high gables and roofs, the elongated window, the slender shafts, the lofty pinnacles and spires, and the lancet, as well as the equilateral-shaped arch. The mouldings were alternate rolls and deeply-cut hollows, not parts of circles in section, but they were treated with a freedom quite opposed to the geometrically correct method of a few years later. Salisbury Cathedral, erected 1220, is a perfect example of the style. By the grouping of the simple lancet windows, bold and beautiful effects were produced, and in no other country of the globe do we find anything similar; this and the third period of English Pointed Gothic or "Perpendicular," of which we shall speak later, being peculiar to our country. The Early English style reached its perfection in the middle of the thirteenth century, and towards the end we find much less freedom in the treatment of features and detail, until at last geometrical patterns became the regular mode of decoration. The hollows of the mouldings are correct semicircles, and the rolls themselves are far less prominent. The window forms underwent a striking change. Take, for instance, a triplet of lancet-windows of the Early English: a lofty centre one, and one on either side, considerably shorter, and these three enclosed under one drip or label-mould. In the new style known as "Decorated," or the second period of English Pointed architecture, the jambs between the lights are reduced to mere shafts, the spandrels above are pierced, and one large window is produced, the upper part of which was filled with rich geometrical tracery. One of the most elaborate and beautiful windows of this date is at Carlisle Cathedral, and has been well illustrated by Mr. Billings, in his work on that cathedral. There was no end to the variety of decoration and ornamentation used at this date, and we find most singular ideas embodied in stone, showing how thoroughly the masons understood the use of that material, how to apply its strength in difficult positions, and how to make it conform in every way to their wills.

DIAGRAM OF AN EARLY ENG. WINDOW.

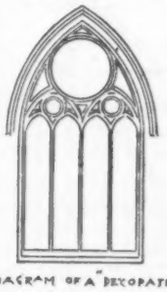
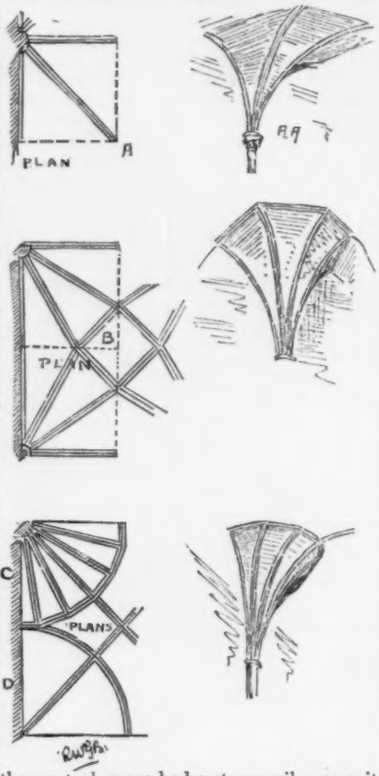


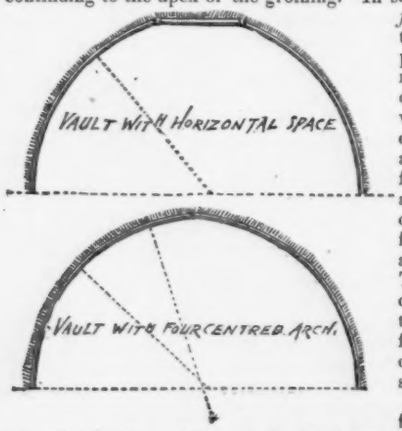
DIAGRAM OF A "DECORATED" (EARLY) WINDOW.

The English vaulted roofs were very superior to the French, the narrowness of the naves adding to the facility of construction. In all cases of early work, the vaulting shafts run from the ground through the clerestory, and terminate with the copings of the walls,

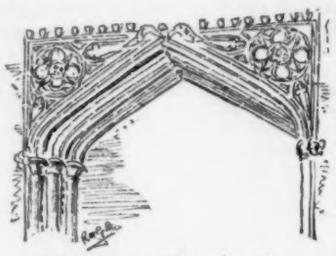
[1] A Sketch of the History of Architecture from the commencement of the Grecian Art to the Reformation in England, by R. W. Gambier-Bousfield, A.R.I.B.A. Continued from page 29, No. 473.

so that in this form they were evidently intended only to support wooden roofs, whose main timbers would rest upon the tops of these shafts. It may be that it was intended to cut them away down to the string-course, as was actually done at Norwich, in 1446, when the nave was vaulted; but in the beginning of the thirteenth century the architects were content with such roofs as that at Peterbro', which is the finest example we possess. St. Albans Abbey, in Hertfordshire, has a roof of corresponding pattern; it is a horizontal painted wood ceiling. At Durham there can be no doubt that it was intended to erect a hexipartite vault from the alternate piers and pillars, but before the walls had reached the height necessary for the springing of the vaults, the science had so far advanced that the idea was abandoned, and brackets were introduced to give support to the quadrilateral vault that now exists. This was successfully carried out between the years 1233 and 1284. The vaulted roof of Lincoln Cathedral may be taken as the first type of perfect English vaulting. The original form of the intersecting vault is that of two halves of a hollow-sided square pyramid, placed opposite one another in an inverted position. Half such a vault is shown at *A* and *AA*. Tracery was introduced to conceal the sameness, but at length the angle, as at *B* was cut off. This was an improvement in the appearance, but it left a flat square space, which would have been awkward in a central vault, although in a side aisle, where the space was smaller, it was easily concealed by ornament. By dividing each face into two, the original lines were restored and the central space had a strong rib across it which gave it the necessary support. The sides were then subdivided into any number of parts, and thus a polygonal cone was formed (*C*), that, as Fergusson says, was so near a circle on plan that it was impossible to resist the temptation of making it one (*D*). "So far all was easy, but the flat central space resting on the four cones was felt to be a defect." There was only one way of getting over this, and the necessity gave rise to an invention that, as in the days when the pointed arch was introduced, changed the whole character of the art. By slightly raising this flat space in the centre, and thereby making it self-supporting, a graceful curve was produced, struck from two centres rising from the springing of the fan, and continuing to the apex of the groining. In section we now have the *four-centred arch*, and the last step in the problem had been reached and the efforts of a thousand years were crowned with success. This four-centred arch was soon adopted for windows, doorways, and employed instead of the earlier forms for the nave and aisle arches themselves. This began the period of "Perpendicular," the least beautiful, so far as its details are concerned, of the three styles.

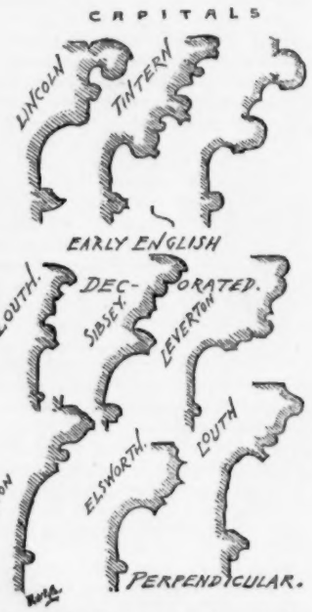



The geometrical forms lasted for little more than half a century, and the flowing tracery even a still shorter period. The Perpendicular was preëminently a constructive style, and nothing could be better, constructively, than the vertical lines running from sill to arch, strengthened laterally by various transoms; but the poetry of tracery was gone, the poetic inspiration of true art was giving way to the rule and the square. The very mouldings became flat and uninteresting, and in the place of rolls, fillets and hollows, large plain surfaces were introduced, giving an appearance of weakness and poverty deeply distressing when compared with earlier work. The outbreak of the Reformation, the seizure and destruction of the cathedrals, abbeys, and other monastic establishments, brought to a close the church-building age, and with it died out the spirit of the art, never to be revived as a national characteristic, never to be tended with a nation's love: dead forever, only to be used in imitation. And yet, can we speak of it as dead when the very stones themselves seem to speak again and forever, in the very silence of their beauty and solemnity? Do not the very mouldings live and smile in the play of light and shade that still surrounds them, as when they first were cut? Art was never born, and art can never die; it is, like the most precious minerals, hidden from human eyes, and can only be attained by deep research and almost endless care. Even when found, there still must be honest, willing, earnest labor before its glory is revealed; it is jealous of itself and slow to expose its beauty to the light of day.



We have taken a very rapid glance at the origin, discovery and development of the noblest of the arts. A very great deal more might have been said, and in fact a thorough description of each century's work would occupy volumes. The study of our art would take up the whole of a long life, but it is hoped that sufficient has been written to raise in the breasts of would-be architects an earnest desire to take up this study for themselves, that they may learn the true principles upon which their future designs should be based, and in true love for their art do their utmost to preserve the pure spirit of harmony in every detail. Architecture is so essentially an art, and the possession of an artistic talent so absolutely a gift, that no one can realize its spirit who has not been born with the talent. Beautiful buildings have been erected by modern architects — truly architects, masters of their art — and the student unable to visit Europe cannot do better than to consider carefully the effect produced, and that which has produced the effect. If he would ask, "How am I to know the good from the bad?" let him understand that he is not meant for an architect; he will never be more than a mechanical one. The instinct of innate art prompts the very soul of its possessor, and he sees in the building before him something he cannot as yet define, that clashes with his spirit, or else an indescribable beauty that makes him stand and gaze, and he repeatedly asks himself: "What is it that constitutes that beauty?" Earnest study is the next course for him, and he will at last experience that thrill of joy as he wanders up and down some old monastic church, and with the impulse of sudden conviction cries aloud, "I understand."

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The Public Buildings Question.—The House Committee on Public Buildings was defeated, on the 8th inst., in its attempt to secure action on a number of bills for new public buildings in various parts of the country. A majority was in favor of consideration, but the opposition was led by Mr. Randall, who is an adept in dilatory tactics. It is generally considered that the committee has gone to the extreme in its liberality in the matter of public buildings. Several bills were passed at the last session and two have been passed at this session, one authorizing a new building at Waco, Texas, to cost $100,000, and the other, a building of like cost, at Carson City, Nevada. Besides these, the committee has reported, and there are now on the calendar fifty-two House bills, six of which have passed the committee of the whole, and fifteen Senate bills. The House bills authorize a total expenditure of $6,127,400, and the Senate bills $2,105,000 more, making an aggregate of $8,232,400. While public buildings in some of the places designated probably are necessary, and it would be a measure of economy to provide them, the necessity or economy of spending money for such buildings at many of the places for whose benefit bills have been brought in, is by no means apparent. The two classes of bills are so linked together, however, by an understanding between their friends, that it will be difficult if not impossible to separate them, or to consider any particular bill on its merits, unless by a suspension of the rules. Even then the danger of "log-rolling" can hardly be avoided. The men who want $50,000 for a building at Wichita or Opelousas will be likely to receive the aid of men who are striving in behalf of an additional $500,000 for Louisville or $700,000 for Pittsburgh.— *New York Tribune.*

## THE MODERN ARCHITECT AND HIS ART.[1] — I.

IN approaching the consideration of the modern architect and his art I feel, to use Mr. Lowell's recent words, that there is little chance of beguiling a new tune out of the one-stringed instrument on which we have been thrumming so long. Without, however, affecting to say anything new, "where everything has been said before, and said over again after," I desire to draw attention to a view of our art which has been singularly neglected, and which, to my mind, deserves infinitely more prominence than any words of mine can give it. What I have to say about modern architecture refers not so much to its archæological triumphs, its teeming types and annual revivals, nor to anything that therein is, but to that therein is *not*. So also, what I would say about the modern architect refers not so much to his wide knowledge, his daring anachronisms and matchless manipulations of historic ornament, but to his shortcomings — not to how he bewitches the general public by what he is, and what he could do if he tried; but to how the intelligent public may fairly be disappointed by what he is *not*, and what he cannot do. In a word, it is as to the scope — or perhaps I should say the limitation — of modern architecture and the ideal of the design (if he have any) to which I wish to draw your attention. Naturally I have chosen a subject which interests me, and, in pleasing myself, I hope I may please you; or at least I may offer an agreeable diversion to brains sorely racked and tired with studies and designs in various styles and periods. There is, I am aware, some danger attached to the criticism of a close profession like that of architecture, which has a royal charter dating from the seventh year of William IV, and which knows how to consume its own smoke. As, however, my point of view is quite an impersonal one, and my remarks general, and as I come before you without a single half-brick in my pocket to heave at anybody, my harmlessness is manifest. I shall then speak my humble mind with all the directness I can command, and trust to your kindness to take no offence where no offence is intended.

It is idle to shirk disagreeable questions, and so I begin with a simple proposition which covers much of the ground we shall traverse to-night. Is architecture, as practised by the modern architect, worth living for? It is a question I have more than once asked myself, but I am not candid enough to confess to you what reply I gave to it. In placing it thus in the forefront of this paper, let me say that the very last thing in my mind is to propagate doubt in the fold of the faithful where none exists; or to shake the confidence of such practitioners as are satisfied not only with the prospects of modern architecture, but with their own prospects and with the worth of their own contributions to the great volume of immortal art. To my mind the question is most suitable to the present time. I will not say that a "crisis" is approaching in the affairs of architecture, because the phrase has lost all its potency by frequent repetition in the newspapers, where we understand that a "crisis" in national affairs is upon us every second day. But I will say that these are critical times for us. A strange calm has come. There is a sense of impending change. This is a time of felt uncertainty, of stranded purposes, of searchings of heart — a time when the issues of things connected with the arts of designs are hanging in the balances. This is a time, too, of disillusionizing alike for architects and for people, when we ourselves are not quite so confident about our method of pushing architectural design forward by means of impulses of an essentially fleeting nature, and when people are beginning to realize that every branch of architecture is well represented by outsiders, and when they are beginning to question the *raison d'être* of the architect at all. This question is, then, a practical one, and one which it is desirable to face and to answer. It at once puts the modern architect and his art in their right place. It makes us compare ourselves not with ourselves (which is not wise), but with the masters of old who brought trained powers, sleepless ambition, and passionate devotion to their work. It has this good effect, moreover — it at once breaks the spell of that direful boa-constrictor of art, mere professionalism. Yes, and in addressing it to the Architectural Association, I cannot forget that I am speaking to those to whom the destinies of English design are to be committed, and it is for you to ask yourselves how you view and how you estimate the art you follow — whether you look upon architecture as a divinely inspired art that can rightly claim all the devotion of your being, or whether you take up architecture merely as an honorable profession and a gentlemanly calling. If you take up architecture as your vocation, to be followed with the ardor of a religion, I am not sure that you will succeed in gaining riches or fame; you may have to be happy with small opportunities and small gains, and have to live a life of quiet, unnoticed worth. But you will be happy and contented and grateful all the same. If, on the other hand, you go in for architecture as a profession which only needs the efficient handling of a T-square and ruling-pen, you may, if you are a good, steady fellow, rise to be an eminent practitioner. And if you are a successful practitioner your rewards are great; you may have access to the best society, and to the best columns of the *Times* newspaper; you may be a lion at evening crushes, and wear brown velveteen; you may pose as the patron of the very fine arts, and be a judge of *bric-à-brac*, and a connoisseur of Queen Anne teapots, Chippendale chairs, and such like; you may even hope to be the F.S.A. and the F.R.I.B.A., and even the P.R.I.B.A., if you have paid your subscriptions and are alive when your turn comes. Nay, if as architect and surveyor you have a sufficiently large and lucrative city practice, and have time for such things, you may aspire to reach the souls of the people by the art of your tongue as well as by the art of your hand, and almost succeed in adding M.P. to your other titles. And to win these rewards you have only to be a rough-and-tumble ordinary man of the world, with a head on your shoulders, an eye for figures, a well-supported air of general competency, good business qualities, some power of gracious fooling, and the faculty of turning out just what the world expects from you with promptitude and despatch. But as for art, and the mastery of the crafts, and the power of color and form and all that sort of thing, you may neither have any, nor need your friends suspect that such things come within the make-up of the modern British architect! Of course it is ever the snare of enthusiastic youth to press inconvenient speculations home, and it is because I am in the presence of the aspiring fledglings of artistic gifts and good parts who form the Architectural Association that the question as to the innate worth of modern architecture comes before me. In another place — where the birds are not only fully fledged, but have feathered their nests, and, like Jeshurun, are not exactly able to soar — I dare not hazard it, nor you either. Let it not be supposed that I have low opinions about architecture, or that I would willingly shake the allegiance of any young heart that has found peace in its pursuit. Let no waverer be downhearted; there may be a lucrative future before him. Let him stick to his last, by which I mean his T-square and ruling-pen.

To proceed. I said just now that this question touching the worth of modern architecture as a serious life's pursuit puts our art in its true place. Instinctively one feels that while it is applicable to the modern architect and his art, none but a fool would have put it to William of Sens, Jocelyn of Wells, Alan of Walsingham, William of Wykeham, Thomas Chard of Glastonbury, or to Bramante, Michael Angelo, Christopher Wren, Inigo Jones, or Adams or Chambers, and there must be a reason for this.

Again, none but a fool would ask the modern musician, or the sculptor, or the painter or poet if his art were worth living for. Indeed, here are living arts, each with its ideal conception to symbolize, each with its mission to stimulate, delight, and console mankind, and to raise men's minds out of money-grubbing grooves into a less selfish, less sordid, less commonplace atmosphere. It is significant that in each of these cases the artist is his own craftsman; he thinks his own thought, clothes it himself, and spares no pains in the elaboration of the clothing. He keeps no ghost, and if he does he is not thought to be respectable. But the architect's ghosts are legion — on his premises and off them — and he is not one whit ashamed. In calculating the place and mission of the modern architect, one is reminded of what is happening in the bee-world just now. By the aid of an ingenious patent, ready-made cells are stamped out in wax (adulterated of course) of the correct shape and size, and when placed in the patent hive the bees forthwith complete the cells, and fill them with honey. And the very counterpart of this is happening in the human world; the royally-instituted architect makes the cells, and the decorators and manufacturers fill them with honey. You know quite well that the English people have not to thank the British architect for the poetry of their homes. You know that one of the noblest provinces of architecture, that of turning necessary articles of daily use into works of art, has fallen from the architect's hands. You know that all the pretty things that dignify modern life come from the "largest furnishing establishments in the world" in Tottenham Court-road — from those homes of champagne and shoddy where the red sealing-wax "Early English" furniture, and the wood coal-boxes adorned with roses and daffodils, and the cast-iron over-mantel china closets come from; where you may get a dozen very cheap high-class native oil-paintings at one counter, and a dozen very dear native oysters at another.

Again, we must confess that the other contemporary arts I have enumerated have been affected for the better and not for the worse by the influences of the day. Each has won new triumphs, each has found out new chances of appeal, new domains for display. But not so architecture, for while it has gained nothing it has lost nearly all. In respect of the use of iron for constructive purposes, and of patent sanitary appliances, which builders and sanitary engineers have devised for us, we score something. Yet, however blessed the iron joists and D-traps are, and however lucky we are to be able to use them, the architects of old, who knew them not, were infinitely more accomplished all-round men than ourselves; and I do not know that, after all, our houses are either more stable or more sweet and wholesome for body and soul to inhabit than the old homes of old England.

But further. The practice of these arts of color, sound, form and word directly conduce to the development of artistic genius; nor could you be a successful composer if you had no musical genius, nor

[1] A paper read by Mr. John D. Sedding, at the second ordinary meeting of the Architectural Association, on "The Modern Architect."

an eminent literary man without literary genius. Yet you can be accounted an eminent architect, and reap all the honors of the profession, without possessing or feeling the want of artistic genius. In putting the case thus strongly, do not suppose that I am blind to the noble gifts and genius of certain architects working with us and shedding their helpful influence amongst us at the present time; and, but for my resolve to keep this paper impersonal, I would name them and speak of them with all the genuine admiration and respect I feel for them. Do not mistake me on this point; I speak of rank and file, and not of these. And I ask whether architecture as now practised ought not rather to be accounted as a "useful" than as an "ornamental" — or, as some would call it, a "fine" — art? I ask whether architecture can any longer be termed the "Queen of Arts," when all that remains of her is the skull and the feet, and the palms of her hands? I ask if it be not true that architecture has ignominiously resigned her throne, lost her honors, and bartered the sceptre of preeminence with which she has held sway from time immemorial, and only reserved for herself the sovereign right of levying a tax of five per cent on other men's labors? I ask whether it is not true that the engineer has (whether civilly or uncivilly it matters not, as the thing is done) robbed the architect of one-third of his domain on the one side, and whether the decorator and manufacturer have not between them robbed him of another one-third on the other side? I ask whether the architect of to-day is, or need be, anything more than a paper-draughtsman to sit on a stool and invent new sorts of doors and windows? I ask whether his business in life is not that of a designer of shells of houses for decorators and manufacturers to finish and furnish, and who varies this jackal occupation by occasional jobs for an engineer, who hires him to do the "pretty" upon a bridge or railway station? Yes; and such of us who like to see iron skeletons clothed in shoddy ornament, may, after refreshing our bodies, refresh our souls at the York or Bristol railway station, and realize at the same time the mission and scope of the modern architect and his art.

Now if you think that what I am saying is approximately true, you will agree with me that it is high time the position of the modern architect and the issues of his art were overhauled; and when this shall be undertaken, I know no better place for the investigation than under the roof of the house which contains the Royal charter, granted expressly to a certain institute for the advancement of architecture and the various arts and sciences connected therewith. If it be for the better advancement of the arts and sciences that architects abstain from personal relations with them, then it must be granted that they are, with much self-denial and self-abnegation, fulfilling the obligations of the charter under which they are enrolled. However this may be, I cannot help saying that, to my mind, every celebration of the Institute commemmorates not the marriage, but the divorce of architecture from the arts and sciences connected therewith. I have laid before you evidences of this in what has already been said, and it would be easy to go on multiplying the proofs. Indeed, it is an undeniable fact that the arts and sciences which of old were ever indissolubly connected with architecture, have passed to the care and conduct of the specialist and the manufacturer. The British public goes to its shops and specialists for any matter connected with domestic art; and if you are a parson with wants, you go to an ecclesiastical shop, and while one shopman is fitting on your coat, or taking the shape of your parsonic head for a new stiff hat, you can be ordering of another shopman a sculptured reredos, an altar and font and lectern, and that sort of thing. Yes, and I saw a striking letter the other day, written by the head of a well-advertised carving establishment, which stated that, inasmuch as not more than half a dozen of the writer's architect clients could prepare their own details in an artistic manner, he had started an office and a staff of clerks to do for the architects what they could not do for themselves. And remember that the architects here referred to were of the Gothic school, which represents the best masters of detail. Even in the matter of building houses, the better sort of builder has his own staff of draughtsmen (or compiling copyists, as some would call them), who can invent new sorts of windows and doors, and draw convenient plans, and make pleasing combinations of colored materials after the approved fashion. The public may soon begin to inquire wherein the architects' clerks and the builders' clerks differ. The State, as you painfully know, has a very summary way of dealing with the architect, inasmuch as it entrusts its buildings to the engineers and officials of South Kensington, and maintains an office of salaried draughtsmen for carrying out public architectural works. And what is happening at Kensington, where engineers combine with ornamentalists to carry out the State's architectural works, may happen in other cases; for the public will see that, given a good builder, an engineer, and an ornamentalist, any building is possible. And the architect has only his own sloth and incapacity to thank for a state of things which in process of time will assuredly work his own extinction. The experts he has called into existence have silently undermined his position. He called in aliens to help him in his need, and the alien army is a standing menace to his position, and will in time dispossess him. Lacking science and lacking art, he is just nowhere if the scientist and the artist combine for his effacement. There is a good deal of what Mr. Ruskin would call professional "bow-wow-wow" talked at our conferences and in the journals about the rights and wrongs of the profession; but what cares the world about the architect so long as its wants are somehow supplied? Although we abuse it, the world is fair in this respect, it values us at its own valuation of our worth. It knows we keep ghosts, and it makes no nicely-drawn distinction between an "expert" and a duffer!

But in order to clear the way for some few practical observations I must arrange the subject under three heads: — (1) What is architecture, and what were the functions of the architect in old days? (2) When, and from what cause did the change from the old to the new system take place? (3) Is it possible for architecture under its present conditions to be carried out upon the old lines, and, if so, by what means? Here are three points, each of which would serve as a theme for a long lecture, so that my treatment of each must needs be brief, and simply relative to the matter in hand.

As to the first point, although addressing a professional audience, I cannot define architecture as building erected after an architect's design. One might as well say that the snuff-maker was the final cause of the human nose! There is building which is, and building which is not, architecture; and I would define architecture as imaginative building: in other words, building which expresses the invention or imagination of the builder, and which appeals by this means to the imagination of the spectator. If it is to answer to the description of architecture, the building must have a soul as well as a body. The body is the structure answering to the primary purpose of its erection, and this body should be staple and convenient. The soul is that superimposed something extra to the body — that something which is provided beyond the demands of mere utility, and which is really the expression of the builder's thought and his mode of appeal to the sympathy and imagination of the spectator. In this definition you get the three cardinal virtues of architecture represented — namely, stability, which relates to science; convenience, which relates to good sense; and beauty, which relates to taste. Naturally, the primary purpose of a structure, combined with other like conditions, settles its character and the fit extent of its decoration; and yet, while it is quite fair to define the word architecture as the art of building nobly and ornamentally, you cannot gauge the value of a structure by the amount of its ornamentation. Dance, who built old Newgate, was an architect, and, although his structure has dead black walls of rough-hewn granite, relieved only here and there with niches and statuary, and a savage repellant air, it is imaginative building, and speaks directly to the imagination of the spectator of violence and doom in the true grim Northern manner. A mere builder would have put plain brick walls. And architecture all the world over has the same characteristic qualities — however different the types and the styles of the art represented, however different the scale of the structure, however different the culture and aims and methods of the builders — the architecture carries the impress of thought or invention, or imagination befitting an ornamental art. Architecture is truly a human art, a volume and record of human thought. As long as the structure remains you connect with it the memory of the men who build it. For instance, the monumental art of the west front of St. Alban's Abbey is a more lasting memorial of its reputed father — our only British architect — than the cracked bell at Westminster. And so with other immortal specimens of other immortal artists, "soft-handed" or otherwise. As you look at the architecture of Egypt and Greece you associate it with its authors. The work is steeped in thought, instinct with invention and — so far as its ornament is concerned — eloquent of pleasurable labor. It represents problems of proportions. Ideas are expressed with mathematical accuracy. In Greek art we have, as I need not remind you, the science of building united with accuracy of design and execution. The arts and sciences are here united perfectly. The tide of tradition is represented in full volume, and the designer is the exponent of traditions that commenced in Egypt, and flowed onward through the Greek and Roman and every other period till broken by the Gothic revival.

As I have just said, the architecture of the modern world answers, in all essentials, to the architecture of the ancient world, however different its aims, and character, and mode of appeal. With regard to the latter point, the Classic is a more intellectual art, and demands a more intellectual appreciation. The Greek architect is a man of complete culture, learned in philosophy and geometry, and he addresses his peers. This explains why it is some of us find the heights of Classic art cold, and the atmosphere that surrounds it bleak and grey. The modern architect, like the ancient, is the right man in the right place; and, whether he be cultured or uncultured, prince or ploughman's brother, he is the most skilled man in the building crafts upon the job. The difference is that, being a Christian, he is no respecter of persons, and being a modern, he is no respecter of calculated academic rule, but speaks his thoughts simply and spontaneously, and addresses his art both to learned and unlearned, to rich and poor, to bond and free.

But now, as I turn aside to define the functions of the architect under the old system, I at once feel the ground shake beneath my feet. For who can forget the storm of 1874, after Mr. Fergusson's unfortunate deliverance in the *Quarterly Review* upon this very head. The story of that time affords, I think, a really valuable glimpse into the secret motives of the British architect. The veil lifts for a moment, and he stands revealed with the touchstone of his art in his hand. Directly the elevated position, the professional status and social level of the architect is threatened from below, an army of "soft-handed gentlemen" rush to the rescue. Never in the annals of art (or the history of the Institute, which is the same thing) had so much power of eloquence, so much literary talent, and so much genuine enthusiasm been evinced. The British workman was

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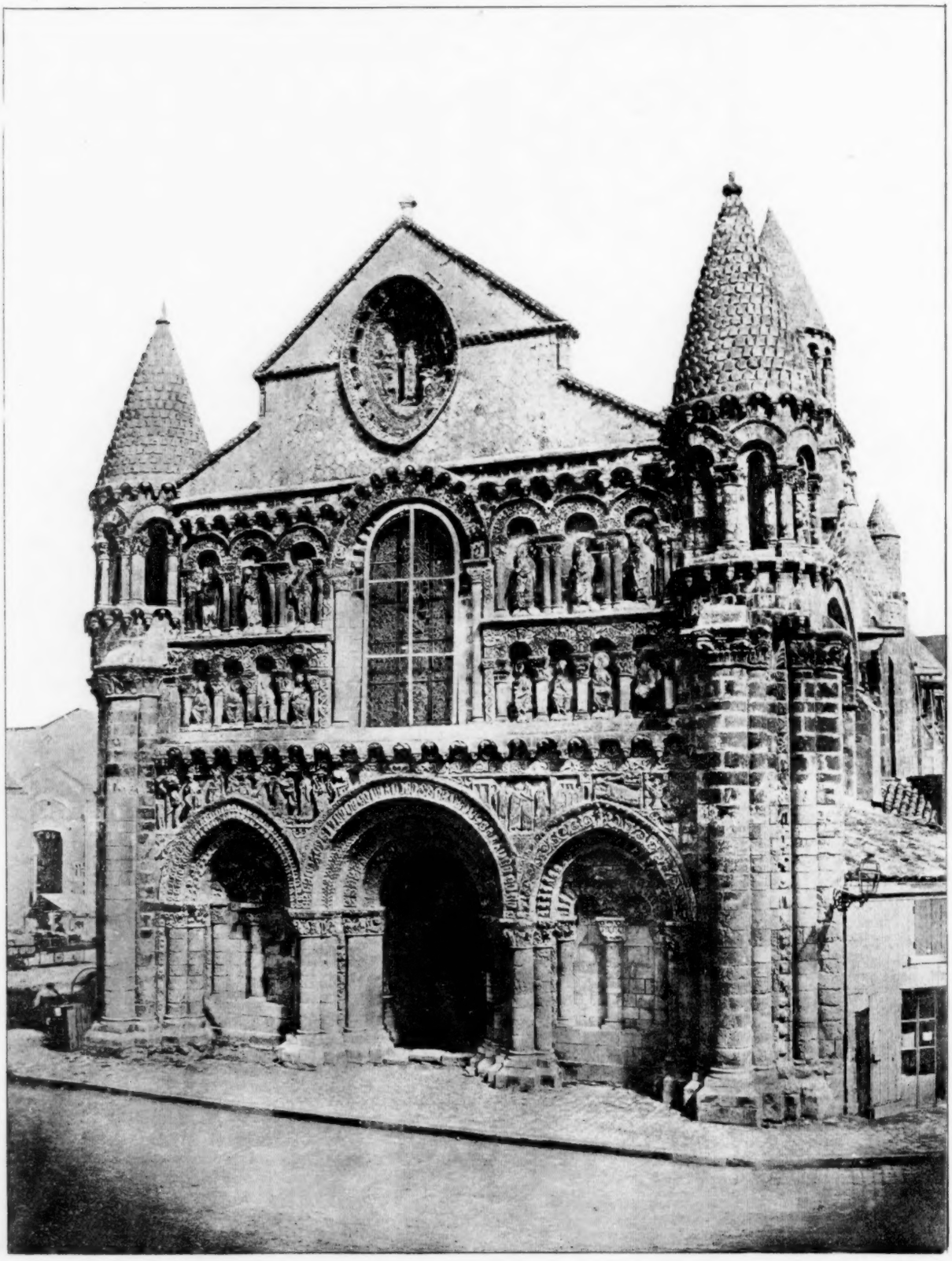

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NOTRE DAME LA GRANDE, POITIERS, FRANCE.

No. 474 American Architect and Building News, Jan. 24 1885

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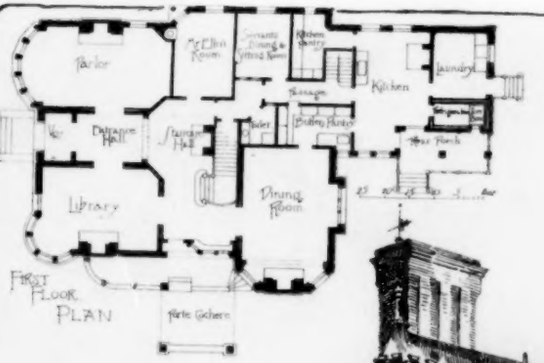
# Residence at Schenectady N.Y.

## for Edward Ellis Esq.

Fuller & Wheeler Archts. Albany N.Y.

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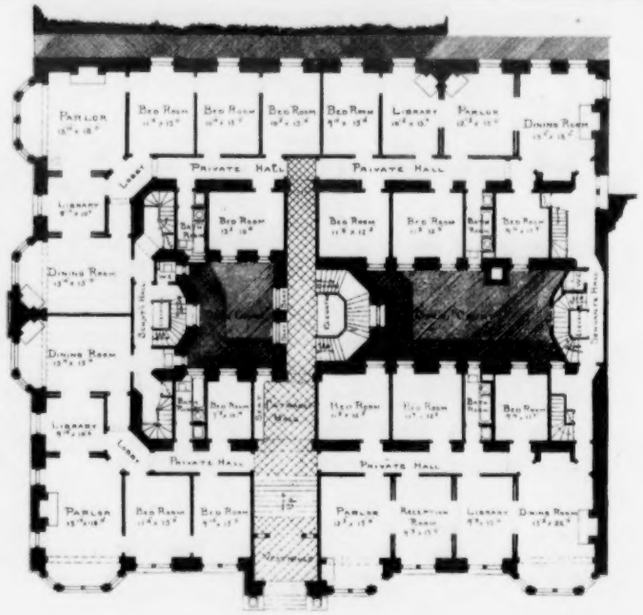
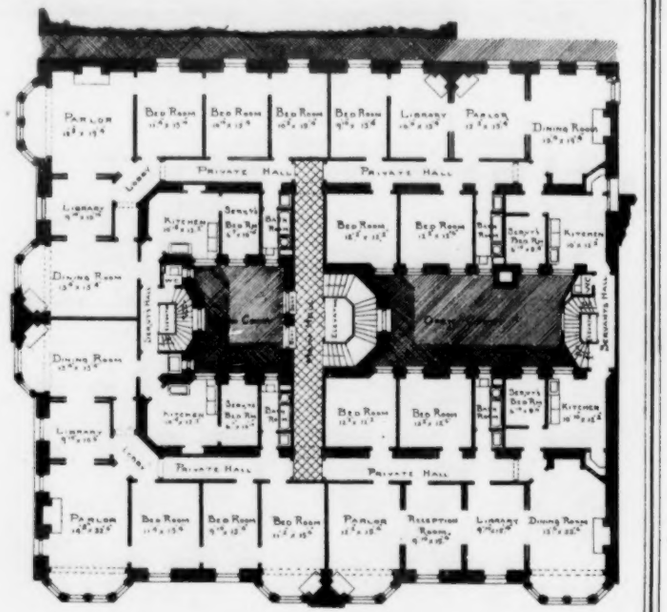



—Plan of First Floor—

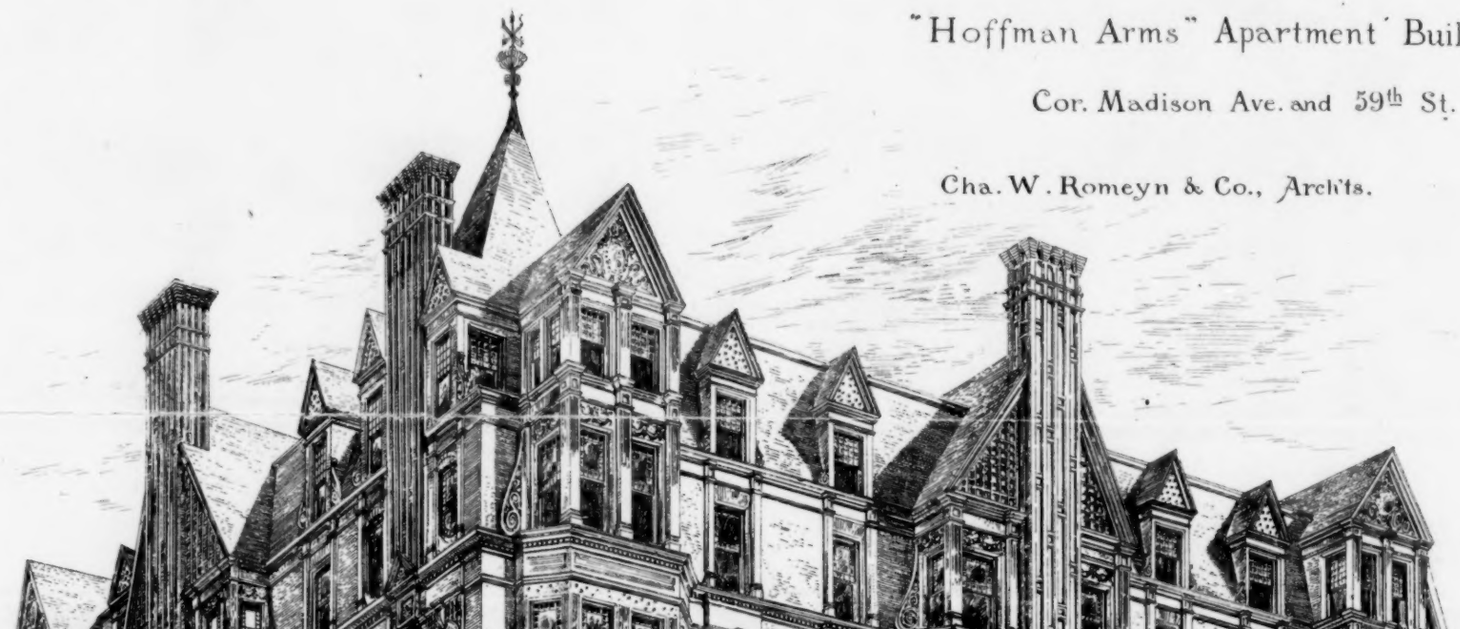



—Plan of Upper Floors—

# "Hoffman Arms" Apartment Building,

Cor. Madison Ave. and 59th St. New York.

Cha. W. Romeyn & Co., Archts.



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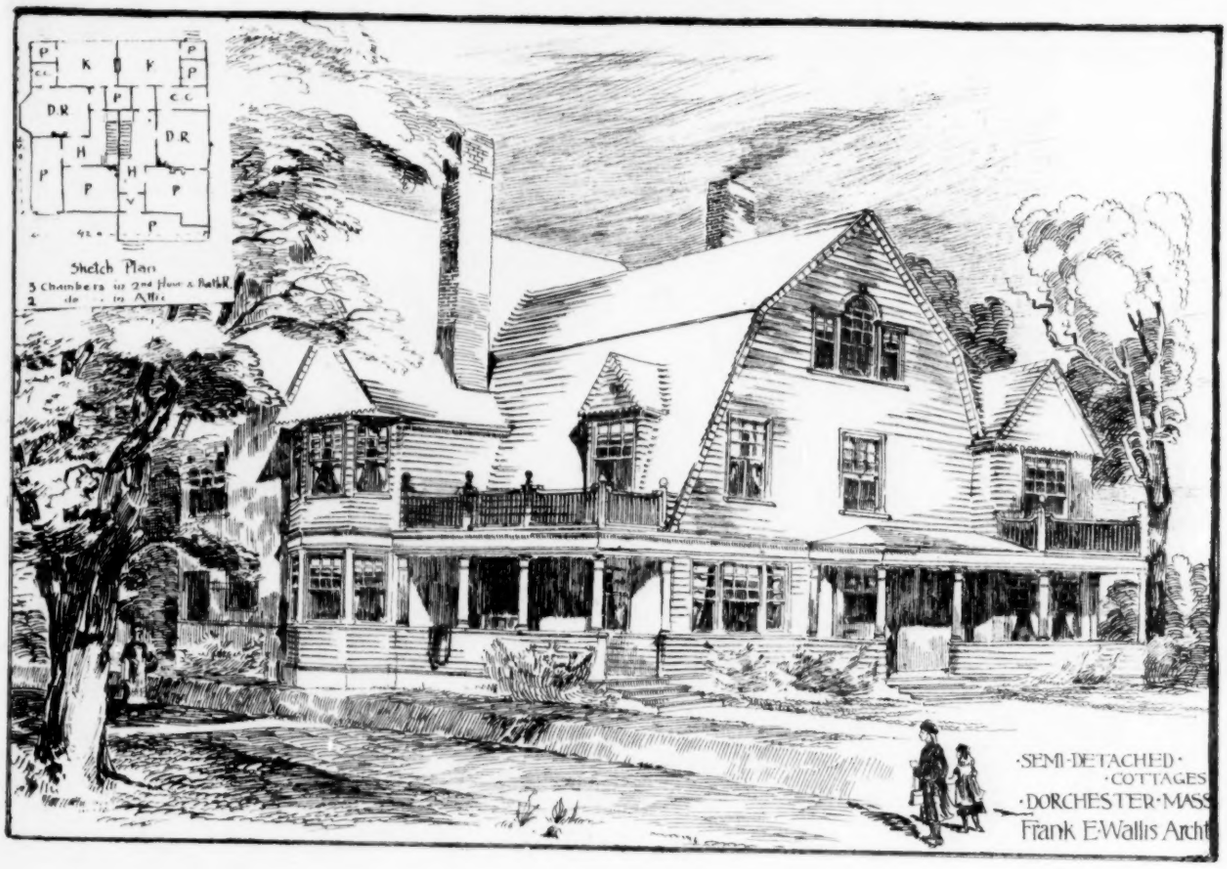


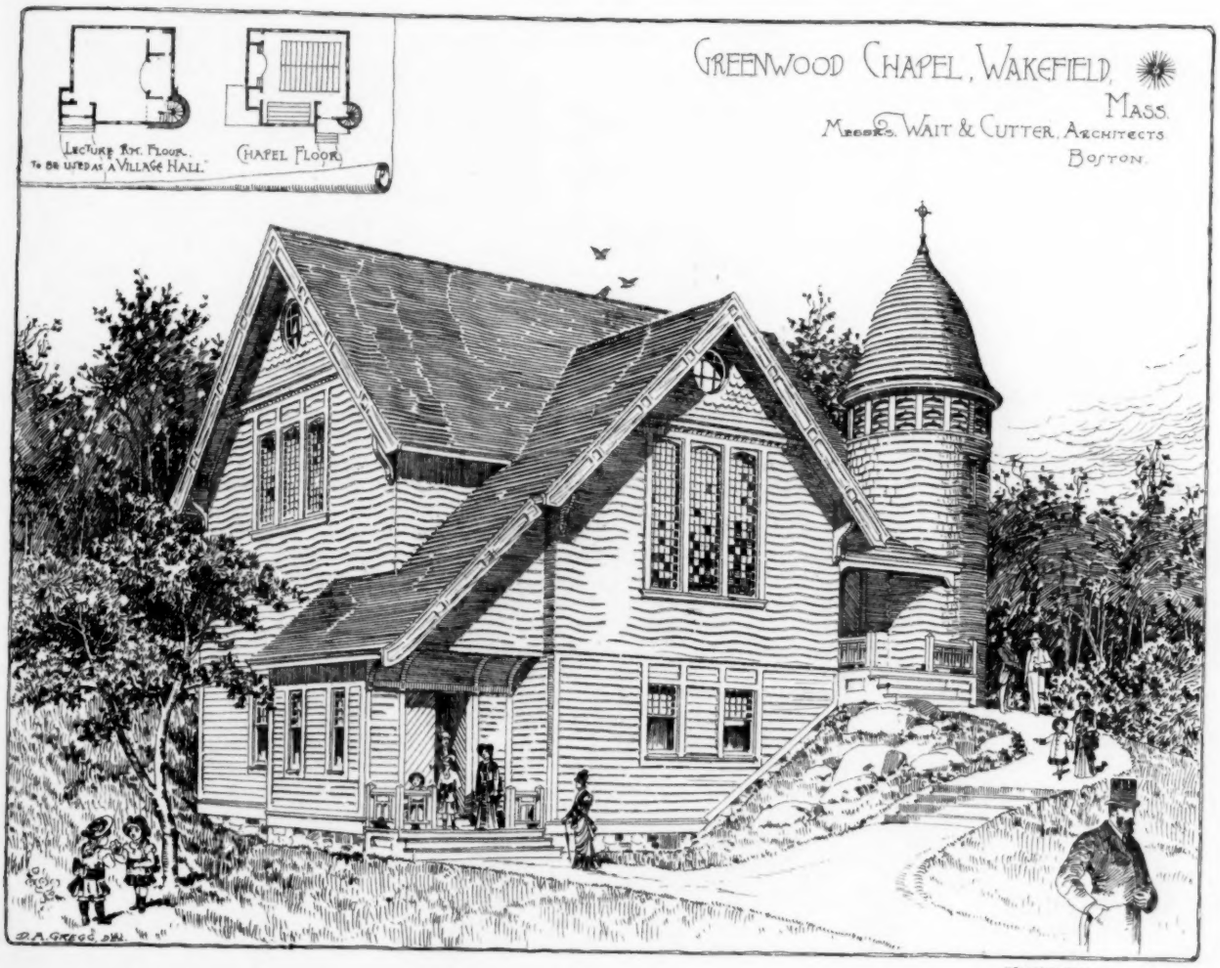


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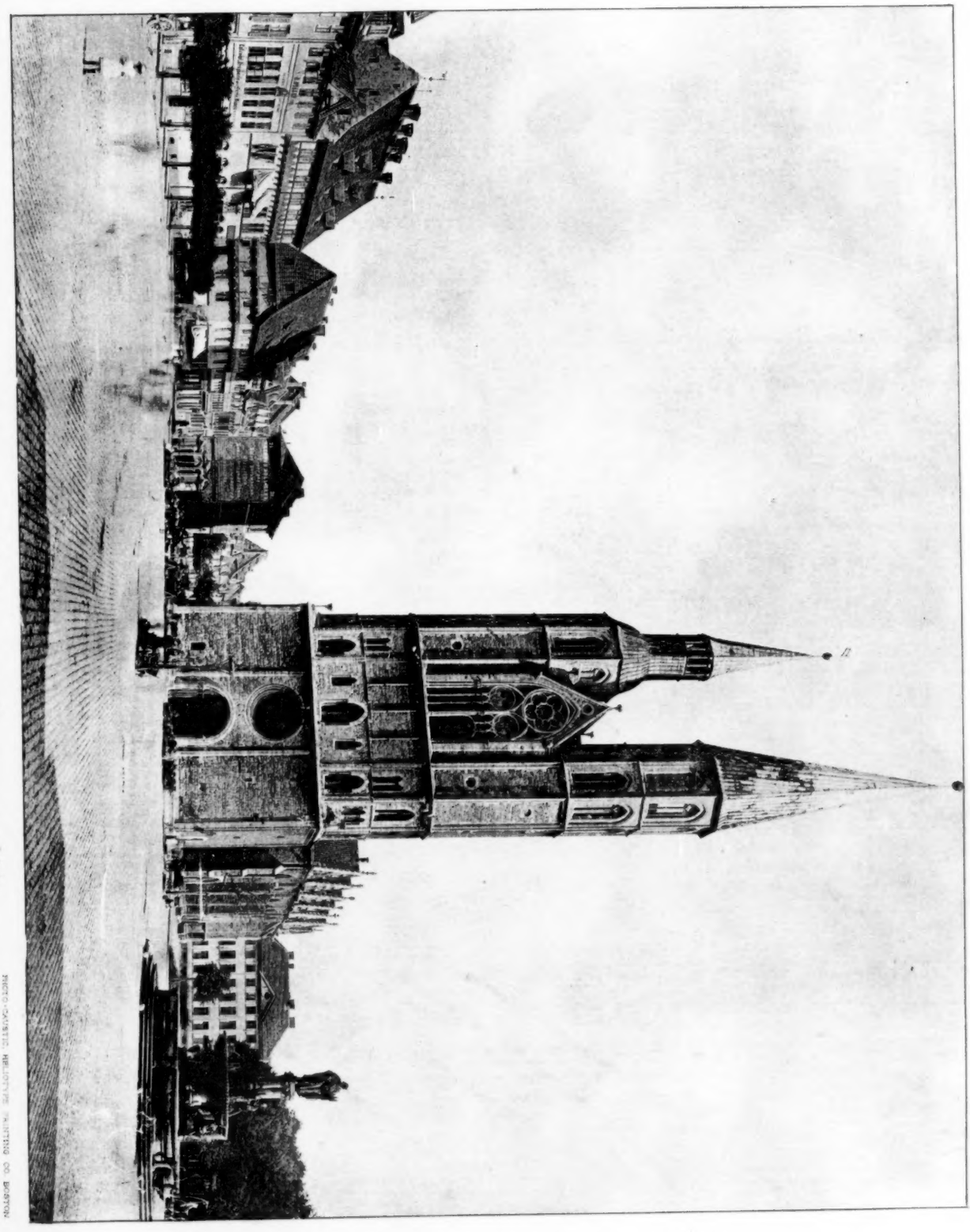

ST. CATHERINE'S, BRUNSWICK, GERMANY. — 1884.

PHOTO-GALVANIC HELIOTYPE PRINTING CO. BOSTON

supposed to be on the march to Conduit Street, to demand enrollment as a Fellow of the Royal Institute, and to be, in this way, there and then constituted into an architect; and, although under the pressing exigencies of the case the parish beadle from the neighboring church, in all the majesty of his Sunday clothes, had been hired to watch the portals of No. 9, and although the Fellows had constituted themselves into a vigilance committee, in day and night relays, to guard their Magna Charta, something dreadful might have happened had the threatened invasion taken place. After all, however, the "unemancipated" British workman stirred not, but abode in his breeches, where I will return to him anon. Looking back at the pitiful affair (and the literature of the episode is innocently printed in the Institute's transactions, "by order of the Council") I have only one remark to make, namely, that whereas the architects were preposterously alarmed lest the workmen should become architects, it never struck them to try themselves to become master-workmen, and so to gain the respect of the workshops by their own eminence in the crafts, rather than by giving themselves airs because of their professional status and soft hands. Luckily for me, it is immaterial to our purpose to inquire as to the social status of the architect as a person, or whether he had soft hands or hard. One thing is certain about him — cultured or not cultured, hodman's cousin or not — he contributed the requisite amount of knowledge and theoretical science, and did not retain experts: he was in direct contact with the work as it grew up; he saw how things were done, and was not the mere figurer of details at an office; he was the familiar spirit of the building, and not the distant dictator of its details. And besides having a general knowledge of handicrafts, he was master of at least one. Some architects were modellers, some carvers, some workers in marble, or in gold, or in ivory, and, plainly enough, we can infer that they worked in workshops, and not in offices or studios. "In Greece," Winckelmann says, "the best workman in the most humble craft might succeed in rendering his name immortal."

Let us turn for a few moments to Italian mediæval art, for we know so much more about the architects of Italy than of those of any other country, and they afford us a ready type of men whose functions covered every matter pertaining to construction and ornament. The Italian architect was engineer, builder, painter, decorator, sculptor, modeller, metal-worker, goldsmith, and the rest; or at least you might expect that the same man could paint a picture, carve a subject, draw and model a bit of ornament, make a gold casket or an urn, design a dress or a fabric, build a church or a palace or a bridge. Thus we see how wondrously the arts were interwoven and technical skill was diffused in mediæval Italy. One craft overlapped the other; there was no hard and fast line of demarcation between them, as with us, and no professionalism, and no Salvation Army of specialists behind the scenes. Naturally, the poor Italian architect had never heard of the Native Asian, African and American styles so much in favor in our classes of design; but had he professed to design any sort of building, he would not have left it to the expert to fill it with plaster-work, or marble, or wood inlays, or basreliefs and color devices, and his art would extend to the provision of gorgeous chests and furniture, and perhaps even to the dresses and portraits of his esteemed clients. Think of Da Vinci, with his superb power of color and form, of his magnificent designs and projects in art and mechanics, and set this man, with his marvelous range, his almost superhuman grasp of mind and boundless ideal, against our puny selves poring over our D-traps and ventilation, and quantity-taking, Metropolitan Building Acts, etc., etc., and if, after instituting the comparison, you are satisfied with the scope and issues of the modern architect and his art, then I think you are eligible to be a Fellow of the Institute without further ado, and I will give myself the honor of proposing you on the first convenient occasion. Now you cannot properly account for the high condition of Italian art in the Middle Ages by saying that the Italian people are a phenomenal people with art in the blood. If so, art would be flourishing in Italy at this time, and it is not. The fact is, that whatever art you examine, of any period, or of any country, you will invariably find that the excellence of the work is only commensurate with the ideal. There is no luck, no chance about it; it is a simple matter of cause and effect, and if the members of the Institute had as high an idea of architecture, and of the various arts and sciences connected therewith as they have of the privileges of the profession and of their professional status, English architecture would be very different to what it is. It needs no prophet to foretell that so long as the modern architect contents himself with grovelling views, and consumes his soul in small things, so long will he grovel and do small things. In Italy, in the Middle Ages, there was a grand ideal to animate the artist and to sustain his art. Of course, many things conspired to favor art there and then, beyond the consanguinity with artistic races, which doubtless had its effect. Italy was then what England is now, the world's emporium, the seat and centre of the world's commerce. There was wealth, and the desire to spend it upon beautiful things. There was the ambition of cultured nobles; there was the inheritance of fine traditions; there was a lovely climate and a flowery land; there was the innate passion for beauty of a passionate and beautiful people. But what raised Italy to her high-water mark of art was the measureless value set upon execution. What Winckelmann said of Greece is equally applicable to Italy: the best workman in the most humble craft might succeed in rendering himself immortal. The designers themselves were masters in the crafts they dabbled in, and they had technical knowledge and technical skill. "Design" then meant something more than it at present does in an architect's office or in our classes of design. It meant the power to *do* as well as to *draw*. It meant executive power and technical skill; it meant that what the brain of the man could conceive that the hand of the man that conceived it could execute.

## THE ILLUSTRATIONS.

THE "HOFFMAN ARMS." MESSRS. C. W. ROMEYN & CO., ARCHITECTS, NEW YORK, N. Y.

THIS apartment building was completed within the past year, is built of brown-stone, brick, terra-cotta, iron, and fire-proof material; the base is of brownstone rough ashlar; the bays of cast-iron, terra-cotta being freely used in the superstructure. The location, corner of Madison Avenue and Fifty-ninth Street, New York, is on property leased from the Hoffman Estate, from which it derives its name, and by which it was built through the aid of Mr. Thomas Kilpatrick. The building contains thirty-two apartments, is thoroughly fire-proof, and cost about $450,000.

HOUSE FOR EDWARD ELLIS, ESQ., SCHENECTADY, N. Y. MESSRS. FULLER & WHEELER, ARCHITECTS, ALBANY, N. Y.

ST. CATHERINE'S CHURCH, BRUNSWICK, GERMANY.

THIS church dates in part from 1252, but the south aisle was built in 1450, and the choir about 1500.

SEMI-DETACHED COTTAGES, DORCHESTER, MASS. DESIGNED BY MR. FRANK WALLIS, BOSTON, MASS.

NOTRE DAME LA GRANDE, POITIERS, FRANCE.

GREENWOOD CHAPEL, WAKEFIELD, MASS. MESSRS. WAITT & CUTTER, ARCHITECTS, BOSTON, MASS.

## SEWERAGE AND SEWAGE DISPOSAL AT PROVIDENCE.[1] — I.

BY GEORGE E. WARING, JR.

COMPETITION FOR EQUESTRIAN STATUES FOR BLACKFRIARS BRIDGE, LONDON. DESIGN BY C.B. BIRCH A.R.A. SCULPTOR

THIS large and elaborate report follows a tour of examination in Europe, made at the order of the City of Providence, by Samuel M. Gray, its City Engineer, assisted by Charles H. Swan, of Boston.

The investigations were made during the spring and early summer of 1884. Their chief purpose related to the disposal of town sewage, the object in view being to devise means for the relief of Providence River, which is now made most foul by the discharge of the sewers of the city. They included a personal examination of the principal works in England and on the Continent. To supplement the knowledge thus gained, schedules of questions were submitted to those in charge of works of sewage disposal. The replies from a certain number of towns, in response to these questions, are tabulated in three large supplement sheets published with the report.

Mr. Gray's investigations related both to the disposal of sewage, and to systems and processes of town sewerage and cleansing. These are described, and some of their details are illustrated by plates.

The ground covered includes not only the usual water-carriage systems of sewerage but the various methods of dry conservancy; the earth-closet, the movable tub, the ash-closet, the improved privy, the pail system and the Goux system; also the pneumatic systems of Liernur and of Berlier, and the pumping system of Shone.

Although containing little not already accessible in the literature of drainage engineering, this portion of the report is its best portion. It does not reach quite to the position of a hand-book, but it groups together in a convenient form much practical information. From the standpoint of the professional reader, the utility of this might well be questioned. It is really a thrashing of very old straw; we had been told most of it before, and more than once. In the direction toward which most of it trends, we had been told more than we find here. This, however, is not the standpoint from which this part of the work should be regarded.

The dead level of local tax-paying citizenship, probably as dead a level in Providence as elsewhere, cannot be impressed by work done in and for the world at large. It must put its hand into its own pocket, and send afield its own engineer, whom it knows and trusts, and must make a good big book of the result of his researches and of

[1] Proposed plan for a Sewerage System and for the Disposal of the Sewage of the City of Providence, R.I., by Samuel M. Gray, City Engineer. City Document, No. 25, 1884.

his lucubrations. Then it is moved — and moved to some purpose. What it gets may not be so good as what it might have got for less money in some other way, but what it gets it believes in and will act on: and so the world gets forward.

From this point of view this publication may be justified.

Apropos of nothing in particular, as it turns out, much attention is given to the relative merits of the combined and separate systems of sewerage, the latter first suggested in 1842 by Mr. Edwin Chadwick, and first carried out by Phillips in 1850–51 at Alnwick and Tottenham. The report says: —

The experience of English engineers has led them to consider it impracticable to exclude the rain falling upon private property from the foul-water sewers, because this would require two sets of house-drains in many cases: one for sewage, connecting with the sewer, the other for the surface drainage of the yard and roof, and leading to other channels. They consider that it would cause many complications, and that it would be an unwarrantable exercise of authority to require the construction of two sets of house-drains. They also consider that the admission of a limited amount of rain-water to the foul-water sewers is an important factor in maintaining their cleanliness, and the prevailing practice with them, when separation is attempted, is to exclude only the rain-water in the streets and public squares, and to admit the rain-water from yards and the rear roofs of houses.

The practice in this country has tended towards a more complete separation of the sewage and the rainfall. This is due in part to the extreme views of some of the advocates of the separate system, and in part, no doubt, to the difference between the climates of the two countries; heavy rainfalls being more common here than in England.

*The separation of the rainfall from the sewage becomes important when the sewage must finally be pumped, and when it must be treated chemically or used in irrigation.* On the other hand, the separation of the sewage from the rainfall becomes important when the rainfall passes into streams that must afterwards serve as the sources of public water-supplies. These conditions, demanding separation, are frequently found associated together.

The question as to the necessity for separation, and of the proper method of removing storm-water, is further complicated by the fact that the first wash of water after flowing over the streets of cities, being contaminated with the droppings of animals and other filth, becomes a variety of sewage possessing nearly, if not quite all the constituents of ordinary sewage, except the peculiar germs of disease associated with human excrement, and except certain chemical products derived from manufacturing waste. By thorough and systematic scavenging, the streets may be kept in such a condition that the storm-water may cause little harm if permitted to pass directly into the streams; but this ideal of sanitary work is seldom attained, and the first washings of the streets during storms are usually extremely foul.

Another phase of the surface drainage of towns presents itself in the larger Northern cities in winter, when a thaw occurs after a long period of snow. The mingled accretions of snow, ice and filth, that have been weeks in accumulating, are then liberated in liquid form in great volumes, and require prompt removal. At such times the capacity of sewers receiving surface-water is severely taxed, ordinary surface channels are so obstructed as to require constant attention, and floodings frequently occur in lower districts, travel being greatly impeded, and property in basements and cellars being often damaged.

The great cost of sewers large enough to convey all the waters of heavy storms has already been referred to, it being prohibitory in most instances. Consequently the question as to the best method of removing storm-water is reduced to a consideration of the objections, from the sanitary or from the financial point of view, to the admission of a portion of the surface drainage to the sewers conveying sewage.

The advocates of the separate system claim, among other things, that some of the earthy matters carried into the sewers by turbid storm-water, particularly building-lime, act as precipitants and cause the deposit of organic matters within the sewers, intermixed with deposits of road detritus, leaves and twigs, brought into the sewers by storm-water. These deposits, when not removed by the ordinary flow of sewage or by flushings, must remain until the next heavy storm, and meanwhile become the source of noxious exhalations.

The essential difference between the two systems, as regards cleanliness and freedom from deposits, arises from the fact that in the separate system the substances to be removed are derived from domestic and manufacturing wastes, while in the combined system there are, in addition, the substances brought into the sewer by the storm-water. Thus, while the scouring power of the sewage in the combined sewers is, at best, no greater than in the separate sewers, and may in certain cases be less, the amount of deposits in them may be greater, and their nature may be such as to render them more difficult of removal. Another result derived from the use of small pipes, as in the separate system, is that a given volume of water, such as the contents of a flush-tank, will produce a greater scour and will more completely wash the interior of the sewer; or, to state it differently, a less amount of water will be needed to remove a given obstruction.

Great stress is laid by the advocates of the separate system upon the more perfect ventilation of the sewers when their size is small, as compared with the ordinary volume of sewage flowing through them.

It is also claimed that organic matter adheres to the upper portions of the interior of sewers of the combined system when they are conveying storm-water, and remains after the storm has ceased, forming a slimy coating; that this soon becomes putrid and promotes the development of swarms of microscopic organisms. On the contrary, it is claimed that the sewers of the separate system, being filled every day to their maximum working capacity, afford less opportunity for the growth of noxious germs.

A comparison between the separate and combined systems from the financial point of view cannot be made explicitly, as such a comparison must be based upon local circumstances to a certain extent. This much, however, may be said concerning it: —

The cost of a sewer depends upon a number of elements, some of which are independent of the size contemplated; thus the cost of sheeting and bracing the trench, of pumping water from wet soils, and, to a very large extent, the cost of excavation, back-filling and paving will not be essentially reduced by diminishing the size of the sewer. The difference in cost occasioned by the use of a smaller sewer is, however, generally in favor of the smaller sewer.

A comparison between the cost of a system of combined sewers and of a system of sewers from which surface and subsoil waters are excluded, will generally show that the latter can be built more cheaply. It should be remembered, however, that the greater cost of the combined system is offset by the provisions for the admission and removal of storm-water. If the necessities of the locality require that the surface and subsoil waters shall be removed by underground conduits, their cost should be added to the cost of the house-drainage sewers, in order to make the comparison valid. Should these underground conduits be equal in extent to the system of house-drainage sewers, the cost of the entire combination will usually exceed the cost of a combined system. In most instances the conduits for surface and subsoil water need not be co-extensive with the house-drainage sewers, nor do they need to be placed at so great a depth. Consequently a great many places exist where a separate system would remain the cheapest after the addition of the cost of the necessary channels for removing the surface and subsoil water.

This long quotation has been given as an example of the fairness of spirit with which Mr. Gray has endeavored to consider and to represent the moot questions arising in his discussion. A few of the suggestions, however, may be open to criticism.

Too much importance seems to be given to the foul condition of street wash at the beginning of a storm. The instances which have long been referred to in sanitary literature as proving that the sewage of towns without water-closets is as foul as that from towns with water-closets were, for modern purposes, vitiated by the fact that in the non-water-closet towns referred to a vast deal of household liquid, especially kitchen slops, is discharged through the street sewer. This becomes after decomposition as objectionable as does the discharge of water-closets and it is much greater in quantity. It is hardly fair to suppose that a modern town which is ready to spend several millions to secure a proper disposal of its sewage would neglect so obvious and important a feature of its cleansing processes as the removal of street dirt, horse-droppings, etc., by some better system than their delivery into public sewers during occasional rain-storms. This "ideal sanitary work" is fast being accepted as rudimentary and indispensable sanitary work. When the question of purifying the outflow of the sewers becomes serious, proper street sweeping will be adopted as a matter of course.

As to the accumulations of snow, ice and filth which adds so much, and so much that is objectionable to the flow of the sewers in winter thaws, they are delivered into streams at a season when they are at least objectionable, and they do not of themselves constitute a sufficient source of nuisance to be regarded as an important factor in the problem.

Not only is the ventilation of the small sewers of the separate system more complete than that of the large sewers, but as the report indicates, the need for ventilation is relatively less, because of the absence of retained putrefactive deposits.

As to the financial comparison made, there is one element of the cost of large sewers which is overlooked: *i. e.*, the cost, where the trenches are in unstable ground, of keeping the work open for the slower process of brick laying. With small pipe sewers, especially with prepared joints, the laying of the conduit occupies so little time that if the bottom can be kept to grade even for a few minutes the pipes can be put in place and the work at once closed in. It is true that the provision for the admission and removal of storm-water in the case of the combined system is of much value, and from the purely financial point of view it may at times, but by no means always, be cheaper to make such provision; but surely, if any subsequent treatment of the sewage becomes necessary, if it is to be pumped or purified chemically, or used for irrigation, the admission of storm-water, — which means the complete pollution of the storm-water — becomes a source of great added cost. The same is true of ground-water which is allowed to find its way into the sewer.

It is not easy to conceive of conditions requiring the sewers for storm-water removal, and the removal of house drainage to be co-extensive, consequently the suggestion that "the cost of the entire combination will usually exceed the cost of a combined system" cannot be accepted as a valid argument. There is no instance recorded of the greater cost of the sewerage of a city by the separate system than by the combined system, and it is doubtful whether one-half of the cost has ever been reached.

In discussing the relative merits of the two chief systems of artificial disposal — chemical purification and irrigation — the tendency of Mr. Gray's arguments and their natural deductions are decidedly in favor of the latter, as an adjunct of "separate" sewering. Whether on the score of cost or of the purity of the effluent, he shows the well-understood advantage of the application of sewage to the soil; but when he comes to make his recommendations his heart fails him, and — leaving his newly-acquired knowledge in abeyance, he advices the chemical system for which, it is true, European experience gives ample precedent — disregarding the serious defects that this experince has shown that system to possess.

The problem presented to Mr. Gray for solution seems to have been this, and only this: To withhold from Providence River and its tributaries the foul matters now carried into them by the outflow of the sewers as at present constructed and as to be extended hereafter.

To dispose of underground water or surface water or sewage *as water*, is no part of it; the sole aim is the suppression of the fouling of the streams and bay. In the solution of this problem he seems to have assumed either that it is necessary, or that it is a matter of indifference to diffuse the foul wastes of the city throughout the whole mass of its drainage effluent, including the large amount of subsoil water, — which his guagings show to be an important element of the flow, — the storm-water falling on the covered and uncovered areas of the city, and so much of the water-supply as is used in fountains and elsewhere, as well as that which has already been fouled in its passage through houses, mills, etc.

If any radical criticism is to be made concerning the scheme it must relate to this fundamental part of it.

Argument may be based both on the actual condition of the sewerage of the city, and on its ultimate extension to the complete drainage of the whole area, after its population shall have reached the 300,000 for which provision is made.

He assumes that the total outflow of the sewers will amount then to 58,000,000 gallons per day. This includes 1-100th of an inch of rainwater per hour from the district drained, liquid wastes from manufacturing establishments, amounting now to nearly 5,000,000 gallons per day, and 60 gallons per inhabitant, *including ground-water*.

The present daily dry-weather flow is 3,000,000 gallons. There are about 50 miles of sewers carrying the sewage of 36,421 persons, and this, with the present mill flow is the chief source of the present fouling. To provide only for the purification of the present flow would be unwise. Whether or not it is wise to provide now for the sewage of 300,000 persons depends entirely on the relation between interest on cost, and the cost of added construction when it shall be needed. In discussing the method of disposal adopted by Mr. Gray it is only fair to accept his figures.

The plan is to construct, at a cost of $2,195,973, main and intercepting sewers to collect all drainage of whatever character from all parts of the area under consideration, and to lead the whole to Field's Point, some distance below the city; that is, the whole excepting the excess of storm-water beyond 1-100th of an inch per hour; when this amount is exceeded the surplus is to flow into the rivers, carrying foul sewage with it.

Steam-pumping apparatus is to be provided at a cost of $275,133, capable of lifting 58,000,000 gallons per day to a height of 28 feet.

To these items there should be added for "engineering and contingencies" fifteen per cent, making a total of $2,841,772.

The question now arises whether this effluent may be most efficiently treated by chemical process or by irrigation. Mr. Gray decides in favor of the former for the reason that an acre of land would be required for each one hundred of the population, or 3,000 acres in all; that this land cannot be obtained in a suitable position; and that the cost of sending the sewage to such land as can be obtained would be very serious. He seems to admit that, as we all know, the completeness of purification would be greater if the sewage were applied to the land, but he believes that by chemical process it may be made sufficient.

He therefore provides for tanks, conduits, filter-press, mixing machinery, etc., land, right-of-way, damages, etc., at a cost of $857,732.

It would seem proper to add to this cost the capitalization of the annual cost of working and maintenance. It would be a moderate estimate to fix the cost of pumping at five cents for each million gallons raised one foot high, or $1.40 for each million gallons raised the whole 28 feet provided for. The dry-weather flow is estimated at 60 gallons per person, which for 300,000 population, would make 18,000,000 gallons. Add to this the present mill waste (5,000,000), and we have 23,000,000 gallons to be pumped per day at a total cost of $32.20, or an annual cost of $9,869.30. It would be moderate to estimate the cost of pumping storm-water for a year at $2,140.70 making the total cost of operating the pumps $12,000 annually. The capitalization of this annual payment at four per cent would be $300,000.

The estimate does not refer to the annual cost of the chemical purification of the sewage, but from the indications given, 50 cents per annum per person would be a low estimate. It is the lowest cost suggested in the report. This with a population of 300,000 would make an annual outlay of $150,000, which capitalized at four per cent, would be $3,750,000.

Adding together the estimated cost of construction and the capitalization of the assumed annual working-expenses, we have a grand total of $6,891,772.

Providence is a very rich and prosperous city. It can afford to spend whatever is necessary to secure any needed sanitary improvement and to purify its harbor; but it will hardly rush into an outlay of this magnitude without inquiring carefully whether or not the work can be done for less money.

*To be continued.*

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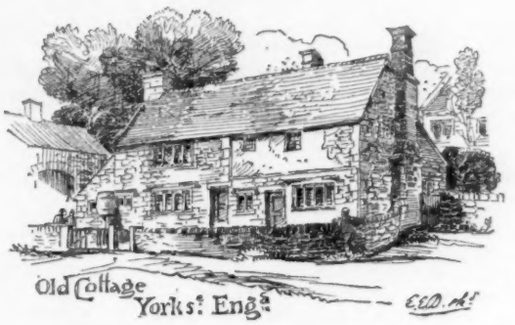
THE WORKSHOP OF A PREHISTORIC ARMORER. — The archæologist, M. Saillard, known through his efforts for the preservation of dolmens, has discovered the workshop of a prehistoric armorer or smith, on a steep rock by the sea on the southwest side of the Peninsula of Quibéron (Brittany). It dates from the Stone Age. Polished lances, arrowheads, axes and other objects are represented in great numbers and in every stage of manufacture, so that the discovery is most interesting, inasmuch as the objects illustrate the workman's method and process. Among the objects is also a meteoric stone worked into an implement. The skeleton of the workman was also found, the skull being very well preserved.—*N. Y. Evening Post.*

## A SUBTERRANEAN EXPEDITION.




A CORRESPONDENT of the London *Times* says that the underground phenomena found in certain portions of the southern and Adriatic provinces of Austria, including miles of underground caverns, lakes that disappear and reappear at regular seasons, and rivers that are swallowed up by the earth, and come to the surface again many miles distant, have recently been the object of much attention on the part of the Austro-German Alpine Club, and of the Club degli Alpinisti of Trieste. A section of the members of the former body determined some time ago to institute a systematic exploration of the subterranean course of the River Reka. Rising in the Schneeberg, in Carniola, this mysterious stream suddenly disappears in the so-called Karst caverns. At San Giovanni di Duino, twenty miles distant from the spot where the Reka is lost, a river of corresponding magnitude is found issuing from the foot of a hill. This stream is known as the Timavo, which takes a westward course and discharges its waters into the Bay of Monfalcone. As to the identity of the Timavo with the Reka there cannot be a doubt, although until the present year no attempt had ever been made practically to demonstrate the fact. The members of the Austro-German Alpine Club, who had resolved to explore the underground meanderings of the river, made their preliminary reconnoissance on March 30th last.

Starting from the first great cavern, called the Rudolph's Dome, the expedition, consisting of four persons in two boats, proceeded on their eventful voyage. From the cavern just mentioned, the river flows for 200 feet through a narrow channel between two perpendicular walls of rock, estimated to be upwards of 100 yards in height. At the end of this channel, the explorers, whose course throughout was illuminated by the magnesium light, found themselves in a vast cavern, where they were able to land. Fastening up their boats, they proceeded for some distance on foot past several cascades and rapids. They followed the course of the stream without much difficulty for a considerable distance, after leaving the newly-discovered cavern, keeping to the left bank at first. At length they reached a spot where the river contracts to a width of barely twelve feet. Here they were compelled to cross to the right bank, which they did by help of a wooden ladder, they had with them. The advance now became more difficult, the explorers being only able to get forward by creeping and climbing. At length they came to the sixth waterfall, which the party was unable to pass. The river here runs between two perpendicular walls of rocks, and suddenly takes a downward leap of over 20 feet. From the Rudolph's Dome where the start was made to the sixth waterfall, the distance is rather over a furlong, and requires half a day to accomplish. At the third attempt the four gentleman forming the expedition, succeeded by help of suitable ladders and other apparatus in getting over this cataract, and advancing some distance beyond it. They soon, however, came to a seventh waterfall, where they were compelled to turn back. They found that to make any further progress, it would be necessary to get a boat past the last waterfalls, as there is no standing room on either side of the stream, but sheer perpendicular walls of rock. The further exploration of the underground river will be resumed as soon as the requisite apparatus can be got ready. In the meantime the Alpine Club has decided to make the approaches to the Rudolph's Dome cavern more easy of access to the general public. The second cavern, which was discovered in September, is of far greater dimensions than the Rudolph's Dome, or any of the other caves of this district. Its height is upwards of 450 feet, so that it could easily contain the Cathedral of St. Peter's at Rome.

With regard to the Italian Alpine Club, its committee has during the the past summer done some good service by rendering the splendid cavern of Trebitsch, discovered by Herr Lindner, 40 years ago, accessible to the ordinary tourist. The cavern can only be approached by descending a deep shaft down which visitors have hitherto had to clamber on the bare rocks. The Club degli Alpinisti have now caused a series of ladders, seventy-four in number, to be fixed. The Trebitsch cavern is 300 feet high, 400 feet in width, and 1,000 feet in length. Through it flows a river, which several authorities believe to be identical with the Reka and Timavo, but the hypothesis is repudiated by many observers. The question can only be settled when the Austro-German Alpine Club shall have accomplished the interesting task it has taken in hand — that of following the subterranean course of the River Reka from its beginning to its termination.

## THE ARCHITECTURAL ASSOCIATION OF MINNESOTA.

St. Paul, Minn., January 9, 1885.

To the Editors of the American Architect: —

*Dear Sirs,* — The Architectural Association of Minnesota held its fourth annual meeting at 219 Nicollet Avenue, Minneapolis, on Tuesday, January 6th, 1885, at which the election of officers for the ensuing year resulted as follows: —

President, Isaac Hodgson, of Minneapolis; Vice President, D. W. Millard, of St. Paul; Secretary, H. S. Treherne, of St. Paul; Treasurer, F. G. Corser, of Minneapolis.

Board of Management: E. P. Bassford, of St. Paul; A. F. Gauger, of St. Paul; G. M. Goodwin, of Minneapolis, and W. C. Whitney, of Minneapolis.

After the meeting the members adjourned to the West Hotel, where they partook of the annual banquet.

The Association is in a flourishing condition, there being forty-two members on the roll, twenty-five of whom have joined during the past year.

Yours sincerely,

H. S. Treherne, Secretary A. A. M.

## NOTES AND CLIPPINGS.

French Art Exports to America.—The business of exporting art products from France to America has suffered greatly from the American duty on pictures and other art creations. The American Consulate has just been compiling the statistics of the art exportation from France to the United States during the past three years. In 1882, the exports were of the value of $1,800,000; in 1883, $1,200,000; and in 1884, only $600,000.—*N. Y. Commercial Advertiser.*

Turner's Refusal of an Offer. — It is a well-known fact that, during the later years of his life, Turner was unable to sell a large number of his pictures, although he seldom asked for them a higher price than the modest 200 guineas which was considered in those days a sum of money considerably beyond the market value of the artist's work. A certain Scotch gentleman, named Munroe, a famous collector of pictures, enjoying an income of from 25,000 to 30,000 a year, greatly admired Turner's genius, and finding him one day sitting solitary in his gallery, surrounded by some of his finest works, for which he had tried in vain to find purchasers, Munroe suddenly determined to make the artist an offer of a certain sum for the whole collection. "Let me have all these," he said, "and I will write you at once a draft for £25,000. Will you agree to that?" Turner appeared not altogether displeased at this offer, but told his friend to go and walk about the streets for half an hour or so, and at the end of that time come back for his decision. This Munroe accordingly did, but at the end of the half-hour, greatly to his disappointment, Turner answered him in the negative, refusing to part with his pictures, even for a sum which at that time would be considered a very large one. Eight or nine of Turner's finest works were among those which Mr. Munroe would gladly have purchased with his £25,000, but as these identical pictures have since become the property of the National Gallery, the admirers of Turner will no doubt rejoice that the Scotch collector was so unsuccessful in his generous bid. — *Pall-Mall Gazette.*

Smoke-testing of Drains. — The only objection to the smoke-test for drains, hitherto, has been that it was troublesome and expensive to apply, chiefly owing to the weight of the apparatus used in applying it. It has been considered necessary to generate the smoke in an iron vessel on the surface of the ground, and from thence to pump it down by means of a centrifugal pump, or fan, into the drain to be tested. As both the generating vessel and the pump were heavy, the use of them involved the necessity of the engineer's going to and from the house to be tested in a cab, and also taking an assistant with him to work the pump. Acting upon a suggestion thrown out by my friend, Mr. A. B. Brown, the eminent hydraulic engineer, of Edinburgh, that the smoke required might be generated inside the drain by means of a "rocket," I have lately devoted a good deal of time to designing cases of different shapes and sizes, and getting them made and filled with a suitable composition by Mr. James Pain, the well-known firework maker. On Saturday, in Christmas week, several of the engineers of the London Sanitary Protection Association, and myself met Mr. Pain's representative at an unoccupied house in Kensington, to try a number of different sizes and shapes of "smoke rockets," and give Mr. Pain an order for the one which seemed most suitable. The one fixed upon is 10 inches long, 2 1-4 inches in diameter, and with the composition "charged rather hard" so as to burn for ten minutes. This gives the engineer time to light the fuse, insert the rocket in the drain, insert a plug behind it, and walk through the house to see if the smoke escapes into it at any point, finishing on the roof, where he finds the smoke issuing in volumes from the ventilating pipes. The house experimented upon on Saturday had three ventilating pipes, and the smoke issued in dense masses from each of them, but did not escape anywhere into the house, showing that the pipes were sound. If the engineer wishes to increase the severity of the test, he throws a wet cloth over the top of the ventilating pipe, and so gets a slight pressure of smoke inside it. The "smoke rocket" is not protected by any patent, and if any person wishing to try it writes to Mr. James Pain, 1 St. Mary Axe, E. C., for "Innes's Smoke Rocket," specifying the size, he will be supplied with any quantity. The plug used with them is made by Mr. Francis Botting, of No. 6 Baker Street, and consists of two short frustra of cones put together small end to small end, with a central screw to draw them together, and a large rubber ring, such as one sometimes sees on the fetlocks of horses, round the circumference, so that screwing up the screw expands the ring, and unscrewing it allows it to contract. This plug answers for applying the water-test to drains as well as for the smoke-test. — *Cosmo Innes in the Journal of the Society of Arts.*

Failure of an Artesian Well Boring. — After an attempt lasting two years and a half, and involving an expenditure of over $25,000, the Winchester Repeating Arms Company has abandoned its attempt to secure an artesian well on its premises. The Arms Company was charged so much by the New Haven Water Company for its supply of water that an independent supply was sought, but, although the work occupied several times as long as was expected, no artesian supply has been obtained, and the manufacturing concern must remain dependent on the water company. The bore, six inches in diameter, had reached a depth of 2,400 feet about two months ago, when some maliciously-inclined person dropped down the bore several pieces of iron one day while the men were at dinner. These pieces of iron wedged in about fifty feet of steel boring tools, and when more than a month had been spent in trying to remove the contents of the bore, the work was abandoned by the contractor. The contract provided that payment should be made by the foot, and for some forty days before the boring tools reached the point where they now remain, the contractor had averaged a net profit of $115 per day. All the expense of trying to remove the obstructions was dead loss to him, and he now says that as a result of his contract he has lost two years and a half of his life without compensation and $1-500 in cash besides. A year ago he was $10,000 ahead on his contract. The obstructions in the bore weigh, he says, about 3,000 pounds. There is only one deeper bore in the world, and that is in a Pennsylvania oil well. The Winchester bore lacks only 240 feet of being half a mile deep. —*New Haven Palladium.*

Replanting Blown-Down Trees.—The following account of how we reinstated several large trees blown down here last winter may be of some service sooner or later to your readers: The trees in question were limes, a hundred and thirty years old, ninety feet high, from ten feet to twelve feet in girth, and had been blown over with at least two and one-half tons of earth attached to their roots; indeed, it was this last condition that settled the determination to proceed with the lifting. The trees were first pollarded at a height of thirty feet from the ground, and even after this had been done, there could not have been a less weight than two tons of timber to be uplifted, but which was nevertheless done in a remarkably short time, and, comparatively speaking, in a very easy manner, by means of the following appliances, viz.: a common two-and-one-half-foot screw-jack and a crab capable of raising five tons, which had a one-and-one-half-inch rope attached, and common cart-ropes for stays and guides. These being all placed in position, it was found that no pulleys and shears would be needed. And so, the holes being duly prepared by breaking up the "pan" on which the trees had grown, and which, by reason of the roots not being able to penetrate it, was the cause of their downfall, a start to raise them was made by two men at the screw-jack, and as each few inches were gained, props of varying length, each one held by a separate man, were placed as directed by the superintendent, and in this way was secured the height obtained by every move of the screw-jack. As soon as the end of the trunks had in this way been raised to a height of from fifteen feet to eighteen feet, the crab was brought into play, and soon the trees were again in their upright positions, and having been well attended to as regards good soil, well consolidated about the roots, there can be no reason to doubt that they will not only live, but grow away as vigorously as ever they did. Should they do so, many besides myself will seriously consider whether or not it is worth while to be at all times in such a hurry to cut up noble trees that have had the misfortune to succumb to a storm.— *W. W., in Woods and Forests.*

The Frogmore Mausoleum. — The memorial service in the Prince Consort's mausoleum, on Sunday week, was somewhat altered from the programme which was used in the time of Dean Wellesley, and it was shorter than formerly. The musical portion of the service had been selected by the Queen and Princess Beatrice, and had been carefully rehearsed by the boys of the choir of St. George's. This mausoleum is one of the most splendid tombs in Europe, and it is a great pity that so bad a site should have been selected, for it is necessary to have fires perpetually burning, summer and winter, in order to keep the beautiful and very costly decorations from being injured by the damp. The building lies in a perfect marsh. The coffin of Prince Albert is enclosed in a sarcophagus of granite, which is in the centre, and which is large enough to contain two coffins, the Queen designing to be herself buried here. The crypt underneath contains nine niches, and was intended to be the burial-place of the Queen's children; but, so far, it has not been used, as Princess Alice was buried at Darmstadt (there is a statue of her in the mausoleum) and the Duke of Albany in the royal vault. It was arranged that the Duke should be buried here; but the plan was reluctantly changed by the Queen, when it was found that he had left written instructions that his coffin should be placed in the family vault under the Wolsey Chapel. The Queen and the Duchess of Albany visited the royal vault during the recent stay of the court at Windsor, in order to inspect the final arrangements which have been made for the disposal of the late Duke's coffin, which has just been enclosed in an oak case, on the top of which is a silver plate, with his titles, etc., and at the head is his coronet, on a cushion. The members of the royal family have always been buried in coffins covered with crimson velvet, with massive silver ornaments; but a few years ago, when the Queen paid her first visit to the sepulchre, she observed that the coverings had become ragged and faded, and orders were given that all the coffins should at once be placed in new oak cases, on the top of which are the plates and coronets. The Duke of Albany lies on the stone table in the centre of the vault, with King George of Hanover, George III, and the Duke of Kent. The other coffins are on the shelves on each side of the vault, which is entered through two gates, from a passage which communicates with the vault beneath the choir of St. George's Chapel. The Prince Consort's coffin was never really placed in the royal vault, but, till it was removed to Frogmore, it stood on a bier in the underground passage just outside the gates of the vault. I believe that the Queen objected to her husband being buried, even temporarily, in the same place with George IV.—*London World.*

# BUILDING INTELLIGENCE.

(Reported for The American Architect and Building News.)

*[Although a large portion of the building intelligence is provided by their regular correspondents, the editors greatly desire to receive voluntary information, especially from the smaller and outlying towns.]*

# BUILDING PATENTS.

*[Printed specifications of any patents here mentioned, together with full detail illustrations, may be obtained of the Commissioner of Patents, at Washington, for twenty-five cents.]*

310,550. LIME-PAINT. — William I. Adams and William R. Polk, Baltimore, Md.

310,566. SHUTTER-WORKER. — Julius Aars Dyblie, Cummings, Ill.

310,579. SASH AND DOOR STICKER.—John H. Glover, Oshkosh, Wis.

310,596. HEATING-STOVE. —Silas H. La Rue, Reading, Pa.

310,603. FIRE-ESCAPE.—Lewis B. McDonald, Little Rock, Ark.

310,625. COMPOSITION FOR GRAVEL OR GRANITE ROOFING, ETC.—Thomas Vaughan, Millvale, Pa.

310,631. SHINGLING-BRACKET.—George W. Adams, Boston, Mass.

310,633-634. STEAM-RADIATOR. — Juan B. Arci and John Chapman, Brooklyn, N. Y.

310,637. HOOD FOR SHUTTER-HINGES. — Chas. W. Barnekow, Newburg, N. Y.

310,662. TERRA-COTTA PAVEMENT.—John M. Freeman, Steubenville, O.

310,667. HOISTING-APPARATUS. — Duncan Gilchrist, Ishpeming, Mich.

310,675. FIRE-ESCAPE. — Tomas P. Hall, Toronto, Canada.

310,678. DEVICE FOR SECURING MOULDINGS.—Charles Halstrom, Los Angeles, Cal.

310,687. CLAMP FOR DUMB-WAITERS. — David D. La Baw, Jersey City, N. J.

310,710. GUIDE FOR BORING DOORS FOR LOCKS.—Chas. Nichols, San Francisco, Cal.

310,713. CHAIR FOR ELEVATOR GUIDE-POSTS.—Charles G. Otis, Brooklyn, N. Y.

310,714-715. STEAM-RADIATOR.—William H. Page, Norwich, Conn.

310,721. WINDOW-GUARD. — John Polkowski, New York, N. Y.

310,731. LEVELLING-ROD. — Robert B. Seymour, Willet's Point, N. Y.

310,738. ELEVATOR. — Israel S. Smith, Sr., Washington, D. C.

310,752. DOOR-CHECK.—Alonzo B. Walker, Canton, Ohio.

310,807. BALUSTER.—James W. Ferer, Renova, Pa.

310,818. PIPE-WRENCH. — Jas. F. Guthrie, Somerville, Mass.

310,824. SHEET-METAL ROOFING-MACHINE.—John L. Holton, New Lisbon, O.

310,825. BLOWER FOR FIRE-GRATES. — Stephen C. Houghton, San Francisco, Cal.

310,839. BENCH-VISE. — William Mickel, Oneonta, N. Y.

310,844. DOOR-CHECK. — Emil Niggli, San Antonio, Tex.

# SUMMARY OF THE WEEK.

### Baltimore.

BUILDING PERMITS. — Since our last report eighteen permits have been granted, the more important of which are the following: —

John Flanney, 3 three-st'y brick buildings, com. n e cor. Druid Hill Ave. and Wilson St.

John T. Miller, 24 two-st'y brick buildings, s s Carroll St.; and 24 two-st'y brick buildings, n s Ward St., bet. Bayard and Wooster Sts.; and 12 two-st'y brick buildings, e s Bayard St., bet. Carroll and Ward Sts.

Louis V. Wise, 5 three-st'y brick buildings, e s Carey St., n of Lafayette Ave.

J. Bauernschmidt, three-st'y brick ice-house, w s Mount St., bet. Pratt and McHenry Sts.

Jos. Hampson, Jr., 5 three-st'y brick buildings, n s Patterson Ave., bet. Fulton St. and Bruce Alley, and 2 two-st'y brick buildings, w s Bruce Alley, n of Patterson Ave.

Henry Weber, 12 two-st'y brick buildings n s Canton Ave., bet. Lucerne and Rose Alley.

### Boston.

BUILDING PERMITS.— *Wood.— Centre St.*, near Rockville St., dwell., 30′ x 30′; owner, W. A. French; builders, Urquhart & Frazer.

*Grampian Way*, n Savin Hill, dwell., 23′ x 23′ 6″; owner, Clarence A. Door; builder, James J. Emroe.

*Adams St.*, near Butler St., poultry-house, 8′ x 12′; owner; William Brooks; builder, A. H. Pierce.

*Philips St., Nos.* 24-26, cor. Longwood Ave., dwell., 12′ x 48′; owner, Bridget Coppinger; builder, A. H. Pierce.

*Water St.*, dwell., 20′ and 16′ x 39′; owner, Michael Downey, builder, A. C. Tully.

*Hyde Park Ave.*, cor. Richards Ave., dwell., 20′ x 25′; owner, Michael Blackwood; builder, R. M. Stevens.

*Spring Park Ave.*, cor. Centre St., wagon-shed, 20′ x 25′; owner, Richard English; builder, Samuel Beal.

*Armandine St.*, cor. Milton Ave., dwell., 20′ and 25′ x 28′; owner, Ephraim Moulton; builder, Ephraim Moulton.

*Whitfield St.*; cor. Wheatland Ave., stable, 22′ x 30′; owner, H. F. Cross.

*Washington St.*, cor. Walnut Park, dwell., 28′ x 34′ and 35′; owner, E. F. Dunbar; builder, A. J. Nickerson.

### Brooklyn.

BUILDING PERMITS. —*Seventh Ave.*, e s, 82′ n Eighth St., three-st'y and basement brown-stone dwell., wood and tin roof; cost, $7,500; owner, Chas. Long, 450 Ninth St.; builder, J. F. Wood.

*Bushwick Ave.*, w s, 17′ s Grove St., 2 three-st'y frame (brick-filled) dwells., tin roofs; cost, each, $3,600; owner, H. L. Bartlett, 805 Quincy St.; architect, Frank Holmberg.

*Bushwick Ave.*, s w cor. Grove St., three-st'y frame (brick-filled) dwell., tin roof; cost, $3,600; owner, etc., same as last.

*Duryea St.*, s s, 100′ w Bushwick Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,200, owner and builder, Wm. Widnall, 1073 De Kalb Ave.; architect, John Herr.

*Seventh and Eighth Sts.*, 440′ e Third Ave., 6 (three on each street) two and three-st'y brick dwells., gravel roofs; cost, each, $3,500; owner and builder, Peter Donlon, 724 Sackett St.

*De Kalb Ave.*, n s, 100′ e Reid Ave., 2 three-st'y brick flats; cost, each, $5,000; owner, Ella Ellis, 55 Devoe St.; architect, Ernest Dennis.

*Hamilton Ave.*, n w cor. Gowanus Canal, one-st'y frame store-shed, felt and gravel roof; cost, $24,000; owner, American Cotton Oil Co., 2 William St., New York; architect, Aug. Hatfield; builder, Hugh Getty.

*Smith St.*, n e cor. Hamilton Ave., four-st'y brick and bluestone mill; also, one-st'y extension, boiler-house; also, two-st'y extension, office, composition roof; cost, $30,000; owner, etc., same as last.

*Tenth St.*, s s, 95′ w Fifth Ave., 5 two-st'y and basement brick dwells., tin roofs; cost, $3,500; owner and builder, Robert Little, One Hundred and Sixty-sixth St., near Forest Ave., New York; architect, R. Van Brunt.

*Lexington Ave.*, s s, 200′ w Throop Ave., 5 two-st'y brick dwells., tin roofs; cost, each, $3,000; owner and builder, Jas. W. Stewart, 373 Quincy St.; architect, M. Walsh.

*Broadway*, s w cor. Jefferson St. and Saratoga Ave., 4 three-st'y frame tenements, tin roofs; cost, total, $10,000; owners, R. & H. Goodwin, 868 Bushwick Ave.; architect, J. T. Miller.

*Dean St.*, s s, 175′ w Franklin Ave., two-st'y brick ice-house, tin roof; cost, $8,000; owner, Budweiser Brewing Co., Franklin Ave., cor. Dean St.; architect, J. Platte; builder, J. Rauth.

*Jefferson St.*, s s, 190′ e Throop Ave., 6 three-st'y brown-stone dwells., felt and gravel roofs; cost, each, $5,000; owner and architect, William V. Studdiford, 241 Broadway, New York; builder, not selected.

*Evergreen Ave.*, w s, 50′ n Troutman St., three-st'y frame (brick-filled) store and dwell., tin roof; cost, $4,000; owner and builder, Geo. Loeffler, 78 Jefferson St.; architect, Henry Vollweiler.

*Van Buren St.*, s s, 179′ e Bushwick Ave., 3 two-st'y frame dwells., tin roofs; cost, each, $3,000; owner and builder, Samuel Post, cor. Van Buren St. and Broadway; architect, H. Vollweiler.

*Evergreen Ave.*, w s, 75′ n Troutman St., three-st'y frame (brick-filled) store and tenement, tin roof; cost, $3,800; owner and builder, George Loeffler, 78 Jefferson St.; architect, Henry Vollweiler.

*Van Buren St.*, s s, 195′ w Bushwick Ave., two-st'y frame (brick-filled) dwell., tin roof; cost, $3,800; owner and builder, Samuel Post, cor. Van Buren St. and Broadway; architect, H. Vollweiler.

### Chicago.

BUILDING PERMITS. —J. A. Wessel, two-st'y store and flats, 2903 Butler St.; cost, $3,900; builder, M. Batta.

J. M. Williams, three-st'y store and flats, 175 East North Ave.; cost, $6,000; architect, E. F. Berlin; builder, G. Wolff.

F. Heimberg, three-st'y dwell., 36 Rees St.; cost, $4,500; architect, J. Zittell; builder, J. Hellman.

M. Walsh, two-st'y livery stable, 120 Twenty-fifth St.; cost, $8,000.

F. C. Wells, two-st'y livery stable, Thirty-fifth St.; cost, $10,000.

J. Jansen, 3 cottages, 714-718 Shober St.; cost, $3,400.

J. D. Robertson, two-st'y dwell., Forest Ave.; cost, $3,000.

H. Hooper, 3 two-st'y dwells., 206 Dearborn Ave.; cost, $10,000; architects, Burling & Whitehouse, builders, Barney & Rodatz.

Wm. Kensilla, 3 two-st'y flats, 39-43 Spruce St.; cost, $15,000; architect, A. Speyer; builder, F. C. Nogle.

A. H. Lowden, 2 two-st'y dwells., 3247-3249 Rhodes Ave.; cost, $11,000; architects, Wheelock & Clay.

### New York.

EXCHANGE BUILDING. — The Building Committee of the New York Mining Stock and National Petroleum Exchange have drawn up plans for their new building. It will be on Broadway. The ground will cost $700,000 and the building $500,000.

STORES.—For the Lorillard Estate, a six-st'y iron and brick store, about 40′ x 126′, is to be built at Nos. 138 and 140 Centre St., from designs of Mr. J. B. Snook.

For Messrs. Jos. Andrade & Co., six-st'y basement and sub-cellar building, 25′ x 145′, is to be built of brick, stone and iron, at No. 95 Bleecker St., from plans of Messrs. Alfred Tucker & Co.

From designs of the same architects, a seven-st'y and basement store and warehouse, 64′ 6″ x 119′, is to be built on the s e cor. of Houston and Crosby Sts., for Messrs. G. Sidenberg & Co., the fronts to be of granite, iron, brick and freestone.

For Mr. Carl H. Schultz, a mineral-water factory is to be built on the corner of Ave. A and Twentieth St., from designs of Mr. Ed. E. Raht.

Messrs. Donaldson Bros. will erect a factory for the lithographing business, on the n s of Park St., commencing 116′ e of Pearl St.

HOUSES. — Messrs. A. Tucker & Co. are drawing plans for a four-st'y and basement brown-stone house, 23′ x 65′, to be built for Mr. Henry Maibrunn, on the s s of Seventy-eighth St., 148′ w of Ninth Ave., and for a three-st'y and basement brick and stone residence, 25′ x 45′, to be built for Mr. S. Adler, on the w s of Lexington Ave., 50′ n of One Hundred and Eleventh St.

BUILDING PERMITS.—*Seventy-third St.*, n w cor. Park Ave., 2 five-st'y brick flats, slate and tin roofs; cost, each, $45,000; owner, John N. Stearns, 10 West Fifty-eighth St.; architect, F. Carles Merry; builders, David T. Kennedy and Myran C. Rush.

*Tenth Ave.*, e s, 26′ n One Hundred and Fifty-sixth St., three-st'y frame dwell., tin roof; cost, $6,000; owner, Josephine O'Neill, 270 West Tenth St.; architect, James Neafie; builders, Mansfield Scudder and Fred. Neafie.

*One Hundred and Thirtieth St.*, n s, 225′ w Sixth Ave., 4 three-st'y brown-stone front dwells., tin roofs; cost, each, $12,000; owner, Samuel O. Wright, 103 West One Hundred and Thirtieth St.; architects, Cleverdon & Putzel.

*One Hundred and First St.*, n s, 250′ w Eleventh Ave., three-st'y and basement brown-stone front dwell., slate and tin roof; cost, $12,000; owner, Robert T. Bellchambers, 317 Sixth Ave.; architect, Jos. M. Dunn; builders, W. T. Adams and Molholland & Connelly.

*Seventy-first St.*, n s, 500′ w Eighth Ave., 7 four-st'y brown-stone front dwells., tin roofs; cost, each, $12,000; owner, Owen Donohue, 505 West Fifty-sixth St.; architect, John Sexton.

*New Chambers St., Nos.* 24-34 *and Rose St., Nos.* 50-58, six-st'y brick store, tin roof; cost, $50,000; owner, Michael Giblin, 125 East Ninety-second St.; architect, Thos. R. Jackson.

*Second Ave.*, s e cor. Sixty-fourth St., 2 two-st'y brick dwells. and stores, tin roofs; cost, each, $3,000; lessees, Chesebro & Whitman, Seventy-ninth St., cor. Second Ave.; architect, R. Rosenstock.

ALTERATIONS.—*Ninth Ave., Nos.* 278 *and* 280, repair damage by fire; cost, $10,000; owner and builder, Hugh Getty, 337 West Twenty-seventh St.

*Fifteenth St., Nos.* 537 *and* 539, *and* 541 *and* 543, rear two buildings, internal alterations, fitting them up for tenements; cost, $6,000; owner, Jas. Mulry, 30 East Eighty-first St.; architect, Frederick Jenth.

*Franklin St., Nos.* 86 *and* 88, repair damage by fire; cost, $5,500; owners, Isaac W. How, 31 East Thirty-seventh St., and Wm. P. Draper, 604 Fifth Ave.; architect and builder, Henry Wallace.

*Fifth Ave., No.* 240, one-st'y brick extension, iron and glass roof, etc.; cost, $10,000; owner, Timothy M. Cheesman, 12 West Twenty-second St.; lessee, Ed. M. Knox; architects, D. & J. Jardine; builders, Chas. T. Wills and W. H. Geduey & Son.

### Philadelphia.

BUILDING PERMITS. — *Poplar St., No.* 1508, brick building, 15′ x 33′ 6″; D. N. Bleyler, contractor.

*Seventeenth St.*, s e cor. Fairmount Ave., one-st'y dye-house, 25′ x 92′; two-st'y stable, 20′ x 32′; boiler-house, 16′ x 32′; and addition to main building, 14′ x 14′; Kister & Overn, contractors.

*Market St., No.* 1011, store extension, 22′ x 26′; Kister & Overn, contractors.

*Sixty-third St.*, cor. Vine St., two-st'y dwell., 20′ x 23′; L. J. Reger & Bro., contractors.

*Grausback St.*, between Indiana Ave. and Cambria Sts., two-st'y dwell., 17′ x 29′; Philip Fitzpatrick, owner.

### St. Louis.

BUILDING PERMITS. — Thirty-six permits have been issued since our last report, nine of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—

W. Patterson, two-st'y brick dwell.; cost, $5,500.

W. Patterson, two-st'y brick dwell.; cost, $5,500.

John Quinn, two-st'y brick dwell.; cost, $5,000.

Alex. McKechnie, 5 adjacent two-st'y brick stores and dwells.; cost, $8,000; Alex. McKechnie, contractor.

S. D. Porter, two-st'y brick dwell.; cost, $2,500; Eystra & Morrison, contractors.

Mrs. Halstead Burnett, two-st'y brick dwell.; cost, $4,500; J. B. Lindsley & Son, contractors.

Mrs. Halstead Burnett, two-st'y brick dwell.; cost, $4,500; J. B. Lindsley & Son, contractors.

Mrs. Halstead Burnett, two-st'y brick dwell.; cost, $4,500; J. B. Lindsley & Son, contractors.

Hild & Guhman, two-st'y brick dwell.; cost, $5,600; J. H. McNamara, architect; J. H. Keefe, contractor.

Mrs. L. Riechmann, 2 adjacent two-st'y brick dwells.; cost, $5,000; Bisser Bros., contractors.

Mrs. L. Riechmann, two-st'y brick dwell.; cost, $3,240; Bisser Bros., contractors.

Chas. Bieckel, double two-st'y brick dwell.; cost, $3,500; P. Souerweine, contractor.

### St. Paul, Minn.

BUILDING PERMITS. — T. A. Prendergast,, two-st'y frame dwell., on Ashland Ave.; architect, A. M. Radcliff; builder, Thos. Fitzpatrick; cost, $4,000.

W. H. H. Johnston, two-st'y frame double dwell., 40′ x 40′, w s of Floral St., bet. Summit and Grand Aves.; cost, $5,000.

Wm. Byrne, two-st'y frame dwell., n s of Martin St., bet. Machubin and Arundel Sts.; cost, $4,000.

Lutheran Church to be built, cor. Wapaska and Tilden Sts.; cost, $30,000.

McAllester Block, to be built bet. Sixth and Seventh Sts., on Jackson St.; cost, $29,000; architect for both the above, Mr. Ulrici.

Washington School, to be built on Eighth St.; cost, $23,000.

Arlington Hill School, to be built; cost, $15,000.

Grand Ave. School, to be built; cost, $2,000; architect for the above 3 buildings, D. W. Millard.

Horace Bigelow, two-st'y frame residence, corner Walnut and Exchange Sts.; architect, Charles T. Mould.

Minnesota Club House, building on cor. Fourth and Cedar Sts.; architect, Chas. T. Mould.

### General Notes.

ATHOL, MASS. — R. Brookhouse is building a frame house, costing $5,000; from plans by E. Boyden & Son, Worcester, Mass.

BROCKTON, MASS. — The School Committee urges the erection of a new high-school building.

CLINTON, MASS.—Lyman Leighton is building a frame house and stable, costing $6,500; from plans by Barker & Nourse, Worcester, Mass.

DUDLEY, MASS. — The Trustees of Nichols Academy are building a brick boarding-house, 40′ x 50′; cost, $15,000; E. Boyden & Son, architects, Worcester, Mass.

LAWRENCE, MASS. — The mayor and aldermen have voted not to grant an appropriation of $40,000 for the building of a public library, as recommended by the trustees.

LESTER, MASS.—The Lester Hotel Company is building a frame hotel, three-st'y, 70′ x 80′, costing $25,000; A. P. Cutting, architect, Worcester, Mass.

OXFORD, MASS. — O. J. Joselyn is building a frame house, costing $15,000; from plans by A. P. Cutting, Worcester, Mass.

SAN FRANCISCO, CAL. — Adolph Sutro, says the San Francisco *Chronicle*, has been quietly at work for a number of years maturing a plan which will place him among the public benefactors of California. He intends to establish a free public library, and to erect a handsome building, and when all is complete to present it to the city.

SPENCER, MASS.—P. J. McDonald is building a frame tenement-house, costing $5,000; E. Boyden & Son, Worcester, Mass., are the architects.

SUTTON, MASS.—A town-hall is being built, 40′ x 60′; cost, $8,000; E. Boyden & Son, architects, Worcester, Mass.

WESTBORO, MASS.—The Methodist Church Society is building a frame parsonage, costing $5,000; from plans by Barker & Nourse, Worcester, Mass.

WORCESTER, MASS. — Walker Armington is about building a block of brick with Sutherland Falls marble finish, 56′ x 126′, five-st'y, containing 35 tenements, and costing $45,000; E. Boyden & Son, architects.

Two brick and brown-stone school-houses, 94′ x 95′, each costing $30,000, are being built cor. Chandler and Gage Sts.

Genery Stevens is building a frame house and stable on London St., costing $6,000.

George S. Clough is about building a frame house cor. Merrick and Austin Sts., costing $8,000.

E. J. Watson is building a cottage and stable on Westminster St., costing $4,000.

Mrs. A. F. Holman is building a frame house on Lancaster St., costing $5,000.

E. E. Carpenter is building a frame house on Brigham St., costing $2,500.

John C. Woodbury is building a frame cottage, costing $2,500.

John L. Parker is building a frame cottage and stable on Newbury St., costing $3,500; Barker & Nourse are architects for 9 houses last mentioned.

Wm. H. Sawyer is building a house of brick and freestone on Lincoln St., costing $30,000.

H. L. Stock is building a frame residence, cor. Main and Hancock Sts., costing $8,000; A. P. Cutting, architect, for last 2 houses mentioned

## PROPOSALS.

**CANAL LOCK.** [Near Charleston, W. Va.]

UNITED STATES ENGINEER OFFICE,
CHARLESTON (Kanawha Co.), W. VA., Dec. 30, 1884.

Proposals for finishing Lock No. 2, of the Great Kanawha River Improvement will be received at this office **until noon, of February 3, 1885,** and opened immediately thereafter.

Blank forms and specifications can be had upon application at this office.

WM. P. CRAIGHILL,
475 Lt.-Col. of Engineers, U. S. A.

**LIMESTONE.** [At Cincinnati, O.]

68 & 69 JOHNSTON BUILDING, CINCINNATI, O.

Sealed proposals will be received at the offices of the undersigned **until noon of Tuesday, the 27th day of January, 1885,** for 5,000 cubic yards of building limestone, for Messrs. Procter & Gamble.

Specifications may be seen and forms of proposal obtained at the offices of the undersigned.

Proposals will be received for all or part of the above quantity, delivered either on the premises, at Ivorydale, Hamilton County, O., or on cars on the Cincinnati, Hamilton & Dayton Railroad.

The right is reserved to reject any or all bids.

ANDERSON & HOBBY,
474 Civil Engineers.

**ROLLED-IRON BEAMS AND PLATE GIRDERS.** [At Washington, D. C.]

OFFICE OF BUILDING FOR STATE, WAR AND NAVY DEPARTMENTS,
WASHINGTON, D. C., January 22, 1885.

Separate sealed proposals for furnishing and delivering the rolled-iron beams and sixteen plate girders required for four floors of the west and centre wings of the Building for the State, War and Navy Departments in this city will be received at this office **until 12 M., on February 17, 1885,** and opened immediately thereafter, in presence of bidders.

Specifications, general instructions to bidders, and blank forms of proposal, for either the beams or the girders, will be furnished to established manufacturers on application to this office.

THOS. LINCOLN CASEY,
476 Colonel, Corps of Engineers.

**COURT-HOUSE ALTERATIONS.** [At Preston, Minn.]

PRESTON, January 9, 1885.

The County Commissioners of the County of Fillmore, in the State of Minnesota, will receive sealed proposals **until the 25th day of March, 1885, at 12 o'clock,** M., at the office of the county auditor, in the village of Preston, said county, for the remodeling of the county court-house in said village, and the building of 2 two-st'y brick additions thereto, and iron vaults therein, and the furnishing all materials, in accordance with the plans and specifications therefor on file in the office of said auditor, which can also be seen at the office of Mayberry & Son, architects, Winona, Minnesota.

No bids will be received except for the whole building complete as specified.

The successful bidder will be required to give a sufficient bond with sureties, within a reasonable time to be fixed by said commissioners, in the sum of $15,000, to be approved by said commissioners, conditioned upon the faithful performance of his contract.

Each bid must be accompanied by a sufficient bond with sureties, or a duly certified check payable to said county in a sum of at least five per cent of such bid, conditioned upon the giving the bond above specified within the time so fixed, provided such bid should be accepted. The work will cost several thousand dollars, and must be completed on or before the first day of November, 1885. Right reserved to reject any or all bids.

J. G. MINER,
Chairman Board of County Commissioners.
Attest: G. A. HAYES, County Auditor.
479

**COURT-HOUSE.** [At Troy, O.]

AUDITOR'S OFFICE,
TROY, MIAMI CO., O., January 3, 1885.

Sealed proposals will be received at this office **until 12 o'clock, noon, of February 11, 1885,** for furnishing all the material and performing the labor necessary to erect a new court-house at Troy, in said County, according to plans and specifications on file at this office.

Bids must be made according to law, and must be accompanied by a bond (to be approved by the Board of Commissioners) for at least twenty-five per cent of the amount of the bid; the bond to be conditioned that if work is awarded, a proper bond and contract will be entered into.

The Commissioners reserve the right to reject any or all bids.

Blanks for bids and bonds can be had at this office, or at the office of J. W. Yost, architect, at Columbus, O.

Bids must be endorsed "Bid for Court-House," and addressed to HORATIO PEARSON,
474 County Auditor, Troy, O.

**PUMPING-ENGINES.** [At Cincinnati, O.]

GLENN BUILDING, ROOM 21,
CINCINNATI, O., January 10, 1885.

The Board of Public Works of the City of Cincinnati will receive proposals **until noon of January 31, 1885,** for the construction, erection and furnishing complete, ready for daily service, of the following machinery: —

Two (2) ten million (10,000,000) gallon high-duty pumping-engines.

The engines will be of the compound, condensing, crank and fly-wheel type: to be erected upon a foundation now partially constructed, and to be finished according to contractors' plans, in the Front St. Pumping-House, Cincinnati. The proposals shall be sealed, and addressed to the Board of Public Works and marked "Proposal for Pumping-Engines."

The successful bidder will be required to deposit with the Clerk of the Board of Public Works $3,000 in cash or U. S. Government Bonds as an earnest of his purpose to carry out his contract, and shall execute a bond with two (2) acceptable sureties, one of whom shall be a resident of Cincinnati, in such sum as may be determined by the Board of Public Works, as a guarantee of his faithful performance of all the conditions of the contract.

One-half of the cash deposit will be returned upon completion of the first engine, and the remainder upon completion of the second engine.

The Board of Public Works reserves the right to reject any or all proposals.

For specifications, forms of proposal and plans of present foundation, address JOHN W. HILL,
Consulting Engineer.
CHARLES DOLL, President,
474 Board of Public Works.

**STEEL CASTINGS.** [At New York, N. Y.]

NAVY DEPARTMENT,
BUREAU OF CONSTRUCTION AND REPAIR,
WASHINGTON, D. C., January 2, 1885.

Sealed proposals, endorsed "Proposals for Steel Castings," will be received at this Bureau **until 12 o'clock, noon, on Tuesday, February 3, 1885,** when they will be opened in the presence of such bidders as may be present, for the steel castings of the turrets of the United States Steamship "*Miantonomoh*, as stated on requisition No. 108, from the New York Navy Yard, at which yard these castings must be delivered within three months after the contract is made, free of all expense to the Government.

The castings must in all respects conform strictly to the schedule for the same, which accompanies and forms part of the requisition, and will be subjected to a careful examination and inspection at the works, by an officer or officers detailed by the Department for that purpose, before being received.

Copies of the schedule and requisition will be furnished to those who are known to have the necessary facilities for doing the work, upon application to the Commandant of the New York Navy Yard.

The proposals must be accompanied with the guarantee required by law, that if the contract is awarded, it will be promptly executed, and the names of parties who are to become the sureties to the amount of the face of the contract will also be stated.

The Department reserves the right to reject any or all the proposals, as, in its opinion, the public interest requires. T. D. WILSON,
474 Chief of Bureau.

**LABOR AND MATERIALS.** [At Greensborough, N. C.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D C., January 19, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 24th day of February, 1885,** for all the labor and materials, excavating, etc., concrete foundations, brick, stone and iron work, wood floors, partitions and roof-framing, slate and galvanized-iron work required for the basement and superstructure of the court-house, post-office, etc., at Greensborough, N. C., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
475 Supervising Architect.

**GLASS AND ENCAUSTIC FLOOR TILING.** [At Jackson, Miss.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 10, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 31st day of January, 1885,** for furnishing and delivering, ready for setting, all the polished plate, polished plate ground, double-thick sheet, and double-thick sheet ground glass, and for furnishing and laying all the encaustic floor tiling required for the court-house, etc., at Jackson, Miss., in accordance with drawings, specifications, etc., copies of which (for each class) and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
474 Supervising Architect.

**GLASS.** [At Kansas City, Mo.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 14, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 2d day of February, 1885,** for furnishing and delivering, ready for setting, all the polished plate and double-thick sheet, and double-thick sheet ground glass required for the custom-house and post-office at Kansas City, Mo., in accordance with specification and schedule, copies of which and any additional information may be had on application at this office, or the office of the local superintendent of the building.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
475 Supervising Architect.

**GLASS AND ENCAUSTIC FLOOR TILING.** [At Memphis, Tenn.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 10, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 5th day of February, 1885,** for furnishing and delivering, ready for setting, all the polished plate, polished plate ground, double-thick sheet, and double-thick sheet ground glass; and for furnishing and laying all the encaustic floor tiling required for the custom-house, etc., at Memphis, Tenn., in accordance with drawings, specifications, etc., copies of which (for each class) and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
474 Supervising Architect.

**LABOR AND MATERIALS.** [At Harrisonburg, Va.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 10, 1885.

Sealed proposals will be received at this office **until 2 o'clock,** P. M., **on the 24th day of February, 1885,** for furnishing all the labor and materials, including stone, bricks, woodwork, etc., required for the construction of the court-house, etc., building at Harrisonburg, Va., in accordance with drawings and specifications, copies of which, and any additional information may be obtained on application at this office or the office of the superintendent, on and after January 23, 1885.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
474 Supervising Architect.

**IRON ROOF.** [At Buffalo, N. Y.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., January 9, 1885.

Sealed proposals will be received at this office **until 2 P. M., on the 31st day of January, 1885,** for furnishing and putting in place the iron roof framing for the extension of the custom-house, etc., building, at Buffalo, N Y., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered. M. E. BELL,
474 Supervising Architect.

**CAST-IRON WORK.** [At Washington, D. C.]

OFFICE OF BUILDING FOR STATE, WAR AND NAVY DEPARTMENTS,
WASHINGTON, D. C., January 8, 1885.

Sealed proposals for furnishing and delivering the cast-iron column and pilasters for four stories of the west and centre wings of the Building for the State, War and Navy Departments in this city, will be received at this office **until 12 M., on January 27, 1885,** and opened immediately thereafter in presence of bidders. Specifications, general instructions to bidders, and blank forms of proposals will be furnished to established manufacturers on application to this office. THOS. LINCOLN CASEY,
474 Col. Corps of Engineers.